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Florida Power Corporation Crystal River Units 4 and 5, Citrus County, Florida

(U.S.) Environmental Protection Agency
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Florida Power Corporation proposes to construct and operate two 695 MW (gross) capacity coal-fired electric generating plants at the existing Crystal River complex in northwest Citrus County, Florida. The EIS examines project alternatives, impacts, and mitigative measures related to groundwater, air, surface water, ecological, and socioeconomic and cultural systems.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

EPA 904/9-81-056
NPDES Application Number:
FL 0036366

Final
Environmental Impact Statement

for
Proposed Issuance of a New Source National
Pollutant Discharge Elimination System Permit

to
Florida Power Corporation
Crystal River Units 4&5
Citrus County, Florida

U.S. Environmental Protection Agency
Region IV, Atlanta, Georgia 30365

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Comments will be received until MAR 30 1981

Comments or inquiries should be directed to:

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Rebecca W. Hanmer
Regional Administrator

January 20, 1981
Date

Executive Summary
for
Environmental Impact Statement

Crystal River Units 4 & 5
Florida Power Corporation

( ) Draft
(X) Final

U.S. Environmental Protection Agency, Region IV
345 Courtland Street, N. E.
Atlanta, Georgia 30365

1. Type of Action: Administrative (X) Legislative ( )

2. Description of Action

Florida Power Corporation (FPC) is proposing to construct and operate two 695 MW (gross) capacity coal-fired steam electric generating plants at the existing Crystal River complex in Citrus County, Florida. The EPA Region IV Administrator has declared the proposed plants to be a new source as defined by Section 306 of the Clean Water Act. Operation of Crystal River Units 4 & 5 would require a National Pollutant Discharge Elimination System (NPDES) permit. Issuance of this permit would be a major Federal action significantly affecting the quality of the human environment. In compliance with EPA's responsibilities under the National Environmental Policy Act (NEPA), an Environmental Impact Statement (EIS) has been prepared.

As a public utility Florida Power Corporation (FPC) is obligated to efficiently provide adequate electric power to its service area customers. Florida Power Corporation has conducted an evaluation of its ability to fulfill future electric power commitments and has determined the addition of two generating units is essential to meeting projected future demands.

In November, 1978, the Governor and Cabinet of the State of Florida issued a Certification Order to FPC for Crystal River Units 4 & 5.

Testimony and reports entered in the certification hearings by the Florida Public Service Commission show that operation of Units 4 & 5 as planned (1982 and 1984) is essential to avoid extremely low generating reserve margins and unacceptably high loss of load probability. Without these units FPC would not be able to meet its responsibilities to the Florida peninsular grid, and generation planning flexibility for the State of Florida would be substantially reduced.

The proposed Units 4 & 5 are to be located on approximately 335 cleared acres at FPC's 4738 acre complex in Citrus County, Florida. The complex is located adjacent to the Gulf of Mexico and between Crystal River to the south and Withlacoochee River to the north. The City of Crystal River is approximately 8 miles southeast of the complex. Currently FPC operates 3 existing generating units (a 383 MW coal unit, a 498 MW coal unit, and an 825 MW nuclear unit) at the complex on approximately 319 cleared acres. The proposed Units 4 & 5 are to be constructed north of the existing units and will be operational for 30 years.

Major components of the proposed units include two 695 MW (gross) electric generating plants, two 440 feet tall natural draft salt water cooling towers, two 600 feet tall chimneys, a wastewater treatment system, a coal storage area, and a residuals disposal area. Approximately 335 acres will be cleared to construct the plants and supportive facilities.

The project as proposed by FPC calls for expansion of the Crystal River complex's existing coal handling facilities. Additional coal storage area will be located adjacent to Units 4 & 5. The existing barge and rail loading facilities are adequate to provide the support for the proposed expansion. A 50/50 design blend of Appalachian and western coal is proposed to be used in Units 4 & 5.

Make-up cooling water for the proposed units will be drawn from an intake structure in the existing discharge canal for Units 1, 2 & 3. An average of approximately 98 million gallons per day will be required for operation of Units 4 & 5. An average of 0.6 million gallons per day of raw groundwater will be required for plant freshwater uses. A well field located along the FPC central Florida transmission line corridor will provide the source of freshwater.

Cooling tower blowdown of approximately 88 million gallons per day will be discharged into the existing discharge canal downstream of the intake structure. Other wastewaters generated at the facility will be segregated as appropriate and directed to a multi-component waste treatment and disposal system. No discharge of these wastewaters to surface waters is proposed as evaporation and exfiltration will exceed wastewater influent flow.

An average of approximately 1,730,000 pounds of residuals will be disposed of daily in a 95 acre, 40 feet high onsite storage area. These residuals will include dewatered bottom ash, pulverizer rejects, fly ash, economizer ash, and gas recirculation ash. FPC is attempting to find a market for the fly ash. Runoff from the residuals storage area, from the coal pile and from the plant site will be settled in two systems of canals and ponds having a detention volume which exceeds the ten-year, 24-hour rainfall event. Normally this detention system will have no discharge to surface waters due to evaporation and exfiltration. However, stormwater runoff which exceeds the detention volume will overflow to the existing discharge canal.

Air emissions will be controlled by boiler design to 0.7 pound NO_x/million BTU, by electrostatic precipitators to 0.1 pound particulates/million BTU, and by low sulfur coal to 1.2 pounds SO_2/million BTU. The design sulfur content of the coal is approximately 0.49%. Particulates generated through coal and ash handling are proposed to be controlled by bag filter units for enclosed structures and by dust suppressing agents for open areas.

Transmission line expansion will be limited to the Crystal River complex. No additional offsite transmission facilities are proposed.

3. Major Alternatives Considered

A. Management alternatives including purchases of power, reactivating and uprating older units, and joint projects were considered. Alternatives were evaluated primarily with regard to meeting projected FPC demands. As evidenced in the site certification meetings, the addition of the proposed Units 4 & 5 has been determined to be essential for meeting generating responsibilities and for maintaining an acceptable loss of load probability for the Florida peninsular grid.

B. Energy source alternatives including nuclear, oil, gas, coal, hydroelectric, and solar sources were evaluated. Major consideration was directed toward the state of the art of these technologies, fuel availability, application to the siting region, and construction time constraints. The proposed coal fired units were selected as desirable based on environmental considerations (in conjunction with siting alternatives), available technology, national fuel use policies, and engineering, licensing, and construction lead times. Hydroelectric facilities are not appropriate to the State of Florida, the Powerplant and Industrial Fuel Act of 1978 generally prohibits the use of petroleum as the fuel source for power plants, and nuclear based generating plants require extremely long lead times for licensing and construction.

C. A detailed siting analysis was performed to assess the suitability of 11 prime locations for siting of two 695-MW units. These 11 locations were selected for additional evaluation based on an initial engineering and environmental screening of identified potential locations. Siting evaluations indicated that integration of the proposed engineering strategy with the facilities and resources at the Crystal River complex would be environmentally preferable to locating a power plant at an unindustrialized site.

D. Spatial arrangements of the units at the Crystal River complex were evaluated to minimize loss to the ecological systems and to utilize existing facilities as fully as possible. Three arrangements were considered.

E. Cooling system alternatives were evaluated considering environmental and economic factors. Cooling systems evaluated included once-through cooling, natural draft wet cooling towers, mechanical draft wet cooling towers, dry and wet-dry towers, and power spray modules.

F. Water source and intake alternatives were evaluated in conjunction with possible cooling system alternatives. Evaluation included quantity/quality parameters, potential entrainment/impingement factors, and economics of water transport. Alternatives included freshwater sources (Crystal River, Lake Rousseau, Withlacoochee River, groundwater) and salt water sources (Gulf of Mexico, Withlacoochee Reach of the Cross-Florida Barge Canal, saline groundwater).

G. Wastewater treatment and discharge systems were evaluated to assess meeting regulatory requirements and to maximize reuse of water.

H. Air emissions control system alternatives were evaluated considering the state of the art of emission control technology, environmental impacts, and economics. Sulfur dioxide (SO_2) control alternatives included low sulfur coal, coal beneficiation, and flue-gas desulfurization. Particulate control alternatives included wet scrubbers, fabric filters, mechanical separators, and electrostatic precipitators. Nitrogen oxides (NO_x) control alternatives included application of various combustion technology strategies. FPC submitted a Prevention of Significant Deterioration (PSD) permit application in 1977 and subsequent to review received a PSD permit in 1978. Under provisions of the Clean Air Act in effect in 1977 FPC was able to elect to use low sulfur coal instead of installing SO_2 scrubbers.

I. Residual waste disposal alternatives were evaluated primarily in conjunction with coal type strategies and air emission controls. Alternatives included marketing of fly ash, pond disposal, mine disposal, ocean disposal, and landfill disposal. Evaluation focused on leachate formation and contamination of ground and surface water.

J. Transmission line alternatives were evaluated in conjunction with locating the units at the existing complex. No offsite transmission corridors are proposed.

K. A no-action alternative was evaluated to consider the effects and implications of not constructing Units 4 & 5.

4. Summary of Major Environmental Impacts

The project is an integration of elements from each group of system alternatives (water source, cooling system, wastewater treatment, fuel, air emissions control, residual waste disposal). Once elements of the project were identified, the environmental impacts of this collective action were assessed.

Primary emphasis of this assessment focused on identifying potential impacts and determining means to minimize adverse impacts.

The direct effect of constructing the proposed units and attendant facilities would be the loss of 335 acres of vegetation at the plant site. Major terrestrial systems affected include 148 acres of slashpine flatwoods, 62 acres of mesic hammock, and 55 acres of hydric hammock.

As a result, wildlife in these areas would be forced to relocate or more likely would be lost. Because of the high transmissivity of the underlying aquifer a reduction in the freshwater subsidy of nearby wetlands is unlikely. Early in the planning stage the proposed plant location was shifted eastward to avoid major areas of coastal salt marsh, coastal hydric hammock, and hydric hammock.

Approximately 160 cubic yards of material would be dredged from the existing discharge canal during placement of the intake and discharge structures. This activity would increase turbidity and mineralization in the discharge canal. These construction activities would require less than one month for completion. The Corps of Engineers is preparing to issue a dredge and fill permit for construction of the intake and discharge structures pending EPA's completion of the environmental review process.

Stormwater runoff would increase during construction due to disruption of the existing vegetative cover and soil structure. The potential for soil erosion would increase during construction. Detention ponds, dikes, and use of mulch and sod would be utilized to control soil loss. No point source discharge to waters of the United States would result if these measures are utilized.

Air quality would be affected principally by fugitive dust (particulates) during heavy construction activities. Water, oil, and dust suppression controls would be utilized to minimize impacts. Additional air quality impacts can be expected from on-site burning and vehicle emissions.

Acoustics impacts associated with construction are anticipated to be minimal since the nearest noise sensitive area is 5 miles distant. Impacts to the socioeconomic system include increased vehicular traffic and the effects of a transient labor population particularly on rental housing in the surrounding area. Other public facilities (hospitals, services, schools) appear adequate.

Major operational impacts would effect surface water, ground water, air and land resources.

Groundwater withdrawal would average 0.6 million gallons per day. Maximum withdrawal would be 3 million gallons per day resulting in an immediate area drawdown of 2.5 feet and a drawdown of 1.75 feet at the property boundary. Biological communities associated with freshwater marshes in the cone of depression could be affected by groundwater withdrawal.

Impacts to the groundwater regime could occur in the form of leachate from the residuals disposal area, coal pile, and plant drains collection pond. The primary constituents of leachate would include acidity, iron, manganese, other trace metals, and dissolved solids. Movement of leachate would be toward the Gulf of Mexico due to natural groundwater flow. Mitigative measures including lining of the residuals area are currently being evaluated as part of a leachate testing and monitoring program.

An average of 98 million gallons per day of water from the existing discharge canal for Units 1, 2, and 3 are to be used as cooling water make-up for the proposed units. Impingement impacts are anticipated to be minimal for several reasons: the manmade discharge canal offers only one outlet (the Gulf outlet), the canal's fish population is predominantly that of larger, more mobile species, the intake velocity and volume are lower than that of Units 1, 2, & 3, and the canal current is seaward. Entrainment impacts resulting from Units 4 & 5 are also anticipated to be minimal primarily since most water withdrawn will already have been entrained by Units 1, 2 & 3.

Cooling system blowdown for Units 4 & 5 would be discharged to the existing discharge canal during normal load conditions at 61,100 gallons per minute and during peak load conditions at 56,700 gallons per minute. Blowdown would be in compliance with provisions of the NPDES permit.

Thermal loading is predicted to increase winter temperatures in the discharge canal 1.5° F above the increases resulting from Units 1, 2, and 3 and to decrease summer temperatures. The discharge canal would continue to be influenced by the existing Units 1, 2, & 3 and as a consequence impacts from Units 4 & 5 should be negligible.

Other process wastewaters would be routed through a wastewater treatment system to a plant drains collection pond. Discharge from this pond would be not permitted by issuance of an NPDES permit. Runoff from the residuals disposal area, coal piles, and plant site would settle in two systems of canals and ponds having a detention volume which exceeds the ten-year, 24-hour rainfall event. Discharge of these wastes to surface waters is not anticipated because evaporation and exfiltration rates would exceed influent rates. However, stormwater runoff which exceeds the detention volume would overflow to the existing discharge canal.

Principal atmospheric emissions from the proposed facility would be nitrogen oxides (NO_x), particulates, and sulfur dioxide (SO_2). Dispersion of these emissions would be assisted by use of 600 feet tall chimneys. A Prevention of Significant Deterioration (PSD) review has been conducted for this project. PSD analysis indicated that air quality changes in the surrounding Class II area and at the Chassahowitzka National Wilderness Area (a Class I area) approximately thirteen miles distant would be within allowable PSD increment levels. Based on this analysis, state and federal air quality standards would not be violated. Fugitive dust emissions from the coal handling and residuals disposal area would be controlled through use of dust suppressing agents in open areas and bag filters in enclosed areas. The PSD permit requires that SO_2 emissions from Crystal River Units 1 & 2 be reduced from approximately 4.5 lb SO_2/million BTU to no greater than 2.1 lb SO_2/million BTU as Units 4 & 5 become operational. Negligible effects on local air quality would be anticipated. Extensive investigations are currently in progress toward understanding the globally significant acid rain problem. Sulfur dioxide emissions from Units 4 & 5 would potentially contribute to this phenomenon. The long term effect on acid rain production is unknown.

Modeling indicates a potential for fogging to occur approximately 344 hours each year. Based on modeling this impact would be highly localized to the immediate plant area and of relatively brief duration.

Salt drift originating from the natural draft cooling towers would be deposited over the surrounding area and could impact nearby vegetation. A monitoring program will be initiated prior to commencement of plant operation to assess potential impacts. This program will be continued through the initial years of plant operation.

Barge traffic associated with transport of coal will tranverse waters known to be within the range of the Florida manatee, an endangered species. Additionally, manatees are known to congregate at the intake canal during spring and fall movements. The U.S. Fish and Wildlife Service of the Department of the Interior rendered a biological opinion stating these activities would likely jeopardize the continued existence of the manatee. The draft NPDES permit, Part III conditions require that mitigative measures as expressed by the USFWS in their biological opinion be implemented to avoid impacts to the manatee.

Operation of Units 4 & 5 would generate considerable residual wastes that must be disposed. The proposed onsite landfill that would be utilized to dispose of these wastes represents a long-term commitment of this land and reduces the potential future uses of the land.

Operational impacts on the socioeconomics of the area are generally considered beneficial. Operation of Units 4 & 5 would employ 132 workers. The direct economic effects would yield approximately $3,400,000 in annual payroll, $300,000 annually for contractural services, and about $5,200,000 annually in property tax. The proposed facility is compatible with current area land-use plans. No occupied residences are located within four miles of the complex. The existng public, medical, recreational, and cultural facilities within the surrounding area would not be significantly impacted. Because of the remoteness of the site no noise impacts would be noted.

5. Draft Environmental Impact Statement Comments

A Draft Environmental Impact Statement (DEIS) was made available to the Council of Environmental Quality (CEQ) and the public on September 26, 1980. A public hearing on the DEIS was held in Crystal River, Florida on October 28, 1980.

Several comments on the Draft EIS were received during the comment period and at the public hearing. Major concerns were expressed in regard to impacts to the groundwater and impacts from salt drift, chlorination, acid rain, fly ash disposal, and entrainment/impingement. All comments and questions have been addressed in Chapter 4 to the Final EIS, "Public Participation".

6. Agency Decision

The Crystal River Units 4 and 5 Draft EIS examined the electric generating strategy proposed by Florida Power Corporation (FPC) and the associated environmental impacts. The Draft EIS also examined several alternatives relative to siting, potential fuel source, heat dissipation (cooling system), air emission control, and residual waste disposal.

Pursuant to provisions of the Clean Water Act of 1977, EPA intends to issue an NPDES permit to Florida Power Corporation (FPC) for Crystal River Units 4 and 5.

The decision to issue the NPDES permit was based upon EPA's review of the project and associated environmental implications and comments raised by other Federal and State agencies, local interest groups, and concerned citizens. Several measures designed to mitigate potential environmental impacts are included as conditions to the NPDES permit (Part III conditions).

A salt drift monitoring program designed to evaluate the operational effects of Units 4 & 5 on the surrounding vegetation will be implemented prior to plant operation. Additionally, cooling tower drift eliminators will be inspected frequently to assure proper operation.

A ground water monitoring program designed to assess whether leachate from the coal pile, plant drains collection pond, and ash disposal areas is contaminating groundwater will be implemented prior to plant operation. The NPDES permit conditions require that a leachate testing and monitoring program be conducted to evaluate the environmental acceptability of potential ash disposal strategies. Such a program is presently in progress. The NPDES permit conditions specify an environmental assessment of the proposed action be performed in consultation with EPA and the State should additional ash disposal site(s) or coal storage areas be needed.

The NPDES permit contains a condition for the protection of the Florida manatee, an endangered species. This condition was developed as a result of the Endangered Species Consultation Process with the Department of the Interior.

FPC submitted a Prevention of Significant Deterioration (PSD) permit application in 1977 and, subsequent to review, received a PSD permit from EPA in 1978.

In November 1978, the Governor and Cabinet of the State of Florida issued a Certification Order to FPC for Crystal River Units 4 & 5.

FINAL ENVIRONMENTAL IMPACT STATEMENT
FLORIDA POWER CORPORATION, CRYSTAL RIVER UNITS 4 AND 5

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FINAL DRAFT NPDES PERMIT, CRYSTAL RIVER UNITS 4 AND 5

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1.0 SUMMARY OF DRAFT ENVIRONMENTAL IMPACT STATEMENT

NOTE: Several design changes or modifications have been made since promulgation of the DEIS. Portions of the text that are affected by these revisions are indicated by underlining. Refer to Chapter 3 of this document for full discussions of the indicated passages.

1.1 PROJECT BACKGROUND

1.1.1 INTRODUCTION

Florida Power Corporation, St. Petersburg, Florida, proposes to construct and operate two 695 Megawatt (Mw) gross capacity electric generating facilities in Citrus County, Florida, near the City of Crystal River (see Figure 1-1). The proposed facilities will occupy part of an established generating site where Florida Power currently owns and operates three power plants, Crystal River Units 1, 2, and 3, and their associated production and transmission facilities. The new power plants will be known as Crystal River Units 4 and 5, and are planned for commercial operation in December 1982 and December 1984, respectively.

The U.S. Environmental Protection Agency (EPA) has determined that water discharges from the proposed facilities will be subject to the National Pollutant Discharge Elimination System (NPDES) new source effluent limitations and permit requirements. As a prerequisite, EPA is required by the National Environmental Policy Act of 1969 (NEPA) to evaluate all potential environmental impacts. In order to fulfill NEPA requirements, a Draft Environmental Impact Statement (DEIS) was prepared and distributed to local, state, and federal agencies and to the public. This chapter of the Final Environmental Impact Statement (FEIS) summarizes the DEIS and technical support documents, describing the proposed project, the need for power, practical alternatives, and expected effects on the natural and social environment.

Pursuant to NEPA, Florida Power Corporation retained an independent, third-party consultant, Environmental Science and Engineering, Inc. (ESE), Gainesville, Florida, to prepare the plan of study, DEIS, and technical support documents under EPA supervision. Prior to commencing work, the objectivity and qualifications of ESE were approved by EPA, with comments received by interested agencies and other parties. All work completed by ESE in the Environmental Impact Statement (EIS) process was reviewed, approved, and modified where appropriate by EPA prior to publication. During this review process, Florida Power Corporation and federal agencies provided comments for consideration by EPA.

In addition to EPA requirements, Florida Power Corporation must obtain state governmental approval pursuant to the Florida Power Plant Siting Act, Chapter 403 Florida Statutes. This requirement supersedes all other state or local regulations and permits. Accordingly, Florida Power Corporation filed an Application for Certification of a Proposed Fossil Fuel Electrical Power Generating Plant Site with the Florida Department of Environmental Regulation (FDER). The FDER assessed the potential effects upon the environment and ecology by the proposed plant. State hearings were held, and approval for the project was granted by the Governor and by the Cabinet in November 1978.

1.1.2 COMPANY, SERVICE, AND SYSTEM DESCRIPTION

Since 1909, Florida Power Corporation, an investor-owned company, has generated, distributed, and sold electricity in Florida. The company service area presently comprises approximately 20,600 square miles in the west-central portion of the Florida Peninsula and in the eastern half of the Florida Panhandle and covers the total area or portions of 32 of the 67 counties in the state.

As of December 31, 1977, the total net generating capacity of the Florida Power Corporation system was 4,120 Mw in the summer and 4,452 Mw in the winter. The system was comprised of 12 generating stations which included 14 heavy oil-fired steam units, one coal-fired steam unit, one nuclear unit, 20 light oil combustion turbine units, and six heavy oil combustion turbine units.

Aside from its installed capacity, Florida Power Corporation has transmission interconnections and interchange agreements with several electric utilities to purchase or exchange power for emergency, maintenance, or other purposes on an as-available basis. All of the Florida Power Corporation generating capacity, including transmission system, is connected to the Peninsular Florida Electric Power Grid system. Within the grid system, Florida Power Corporation currently has various types of power interchange agreements.

1.1.3 NEED FOR POWER

The government of the State of Florida, under which Florida Power Corporation operates as a public utility, requires the corporation to supply adequate electric power to fill the residential, industrial, and commercial demands of customers within its service area. To fulfill its basic obligations, Florida Power Corporation has carefully evaluated the future requirements of its customers in relation to its present system generating capacity and to historical and anticipated trends in electric usage. Based on these evaluations, Florida Power Corporation has developed a generation expansion plan for its system through 1988 which will meet its forecasted requirements. Florida Power Corporation has determined that a key component of its expansion plans is the addition of Crystal River Units 4 and 5 to its system, beginning service in 1982 and 1984, respectively.

The historical growth in energy demands is determined by arriving at a set of assumptions concerning the effect of historical trends, and of factors affecting demand, on future demand. Florida Power Corporation developed the following set of assumptions upon which its forecasts of energy use are based:

1. Normal weather conditions will prevail.
2. The service area economy will continue to improve at a slow, steady rate.
3. No significant loss of energy sales to solar energy will occur until the late 1980's.
4. Personal income will increase at a rate equal to or greater than the Consumer Price Index (CPI); rate increases, if any, will be equal to or less than the CPI. No rate increase effects will be included in the forecast.
5. Florida Power will continue to serve all of the wholesale load which they now serve, including the energy required for the load growth of the existing wholesale customers, except the load and energy responsibility which will be assumed by Seminole Electric Cooperative, Inc., which has announced plans to build two 600-Mw units in the mid-1980's and to take responsibility for its own load.
6. Unavailability of fossil fuels will cause an increase in electricity used for space heating.
7. The population projections made by the Bureau of Economic and Business Research of the University of Florida in Population Studies, Bulletin No. 41, July, 1977, are reasonably accurate.
8. No load management impacts will be reflected in the forecast.
9. Improvements in insulation and in equipment efficiency, and increased emphasis on conservation will result in reduced sales, beginning in the mid-1980's.

FORECASTED DEMANDS

After total sales and total average annual customer forecasts had been determined, annual kilowatt-hour sales per customer were calculated. Statistical equations, based on annual kilowatt-hour sales and kilowatt demand per customer, were used to forecast the seasonal demand. The annual load factor was then calculated to check the forecast for reasonableness. A summary of Florida Power Corporation energy sales is given in Table 1-1. Figure 1-2 shows similar information for peak demands.

Florida Power Corporation forecasts that the net winter peak demand for its system can reasonably be expected to increase from 3,899 Mw in the winter of 1976 and 1977 to 6,580 Mw in 1987 and 1988 which represents a compound annual growth rate of 4.9 percent.

Using a method which calculates loss of load probability (LOLP), Florida Power Corporation evaluated alternative generation expansion plans in terms of system reliability. For generation capacity planning purposes, a criterion of 2.5 days per year including dependency upon interruptible loads and interconnections was determined to be equivalent to an acceptable LOLP value of 1 day in 10 years for firm loads. This LOLP value indicates that a 15-percent reserve generating margin is adequate for the reliability of the Florida Power Corporation system. Florida Power Corporation also evaluated alternative expansion plans from the standpoint of production costs.

Based on these reliability and cost evaluations, Florida Power Corporation developed a generation expansion plan that includes addition of two 695-Mw base load generating facilities, to begin service in December 1982 and December 1984. The need for these new facilities was evaluated further with respect to the Florida Power Corporation system, peninsular Florida LOLP, and reserve margins if one facility or the other were omitted or delayed. Figures 1-3 and 1-4 demonstrate the effects, on the Florida Power Corporation system and on the Florida peninsula, of adding one 695-Mw gross capacity coal unit in 1982 and another in 1984, or of not adding either unit. Without the proposed generating unit scheduled for completion in 1982, the LOLP would rise to between 5 and 9 days per year in 1983, 1984, and 1985. If the 1984 unit were also excluded, the LOLP would reach approximately 14 days per year. In both cases, the system would have negative reserve capacity by 1984. Firm capacity purchases from other utilities and potential joint-ownership of planned facilities of other utilities were also examined as possible alternatives to the new facilities. Based on these evaluations, Florida Power Corporation determined that the two 695-Mw (gross capacity) generating facilities as scheduled are needed to meet the accepted reliability goal of its system, and that cancellation or delay of either facility would result in unacceptable reserve margins and would increase the probability of blackouts and brownouts within the company service area.

1.2 PROJECT ALTERNATIVES

1.2.1 MANAGEMENT ALTERNATIVES

The information required for evaluation of the no-project alternative has been presented in the earlier discussion of need for power. As discussed previously, an acceptable design criterion is that there should be no more than 2.5 days' dependency upon interruptible loads and interconnections per year. Based on these results, it is clear that the no-project alternative would threaten Florida Power Corporation's ability to meet the energy needs of consumers in its service area. Florida Power has long maintained a policy of participating in mutually advantageous power exchanges with other electric companies, and is currently negotiating or has firm purchase contracts with four municipal utilities. The excess capacity in nearby utility service areas is limited, however, and without the proposed units by 1982, the reserves for peninsular Florida will be approaching the 15-percent level, which is commonly considered minimal for maintenance of reliable service.

Only limited benefits could be obtained by a program of uprating older plants or reactivating retired units. Florida Power has engaged in joint projects on a limited basis in the past, and is investigating this possibility for the post-1985 period. However, there are no opportunities for joint projects that would fulfill Florida Power's additional capacity needs in the years prior to 1985.

1.2.2 SITING ALTERNATIVES

CONSTRAINTS

The site selection process for the proposed 695-Mw facilities considered the entire state of Florida north of 27°00' north latitude and east of 85°30' west longitude. A series of site selection studies yielded a list of 185 potential sites, later reduced to 30 sites. Eleven sites were identified as the most promising in the final stages of the selection process. Criteria for screening potential sites are grouped into three categories: general siting criteria, engineering criteria, and environmental criteria.

General Siting Criteria

Preliminary computations indicated that a minimum of 130 hectares (320 acres) of land would be needed to accommodate the proposed units if cooling towers were utilized, versus approximately 730 hectares (1,800 acres) using cooling ponds. Flood hazard, geologic suitability, and access to transportation and power transmission facilities were also considered in site selection. Access to highway, rail, and waterway facilities was considered important, although not absolutely necessary. Any new transmission or transportation corridors required as part of a site alternative were considered integral elements of project cost and environmental impact.

Engineering Criteria

The most important engineering siting criteria pertained to water supply and wastewater disposal. Based upon general engineering design criteria for two 695-Mw units, the required supply of cooling system make-up water was estimated at 76 million liters (20 million gallons) per day. Saltwater cooling towers would require substantially greater withdrawal. Other water uses could add as much as 11 million liters (3 million gallons) per day.

Environmental Criteria

Environmental criteria included air quality, water resources, aquatic and terrestrial ecology, population and land use, archaeological/ historical sites, and other socioeconomic considerations. Federal air quality limitations affecting power plant locations include the National Ambient Air Quality Standards (NAAQS) and the Prevention of Significant Deterioration (PSD) regulations. The federal government and the state of Florida have promulgated regulations pertaining to water resource management in Florida. Federal water quality limitations include the National Pollutant Discharge Elimination System (NPDES) regulations, and new source effluent guidelines for steam electric generating facilities. Site selection criteria for aquatic and terrestrial ecosystems involved: impingement and entrainment of aquatic organisms by intake structures, detrimental effects of thermal discharges and wastewater effluents, disruption of terrestrial habitats by construction of power plant facilities, air quality degradation and cooling tower drift, and all factors affecting the existence of plant and animal species that are endangered or otherwise given special status. Also important in site selection was proximity to parks, archaeological/historical sites, wildlife refuges, areas of high natural productivity, and land and water bodies used intensively for recreation.

DESCRIPTION OF POTENTIAL SITES

Gulf County

The Gulf County site is located on the south side of the Gulf County Canal near its confluence with the Intracoastal Waterway. A once-through cooling system utilizing water from the Intracoastal Waterway was considered, although off-stream cooling would also be possible. The site has favorable roadway access, and coal barges could reach the site via the Gulf County Canal. Rail access could be provided. Extensive improvements to the existing power transmission system, and line transmission losses during operation, would be substantial due to the distance of the site from Florida Power's load center. The site is favorable or adequate in terms of topography, geology, existing vegetation, land ownership, and nearby land uses. However, thermal and saline effluents from an open-cycle cooling power plant at this location could have serious effects on St. Joseph Bay. Air quality impacts also could present problems.

St. Marks

The St. Marks site is located in Wakulla County about 1.2 kilometers (0.7 mile) south of Newport and 3.2 kilometers (2 miles) northeast of St. Marks. The St. Marks River could be utilized for cooling, but there might be an undesirable degree of hydroperiod alteration. The site is favorable in terms of road and railway access. Barge access would require extensive dredging, however, and the site is relatively unfavorable in terms of electric power transmission losses. Other liabilities of the site include its location in a flood plain and its proximity to the St. Marks National Wilderness Area, a Class I area for PSD.

Levy County (2 Sites)

The two potential power plant sites in Levy County are located on the east bank of the Suwannee River and north and south of Manatee State Park approximately 10 kilometers (6 miles) apart. The Suwannee River flow is adequate for cooling purposes at either site. The increase in coal barge traffic could constitute a significant environmental impact. The use of either site would require construction of a new power transmission corridor at least 40 kilometers (25 miles) in length. The southern site may impact some freshwater marsh, whereas the northern site lacks these aquatic habitats. The Suwannee River sites would be among the most sensitive in terms of possible public and governmental reaction, especially if the area is designated as a Wild and Scenic River. The sites would be among the most favorable for air quality permitting of power plant facilities.

Crystal River

The Crystal River property in Citrus County is owned by Florida Power, which operates three power plants at the site using once-through, saltwater cooling. Cooling options for the proposed units include freshwater and saltwater sources and freshwater open- and closed-cycle cooling systems. Highway and rail facilities are available with minor modifications, and barge access and unloading facilities are already available. No new power transmission corridors would be required. The Crystal River site is favorable in terms of nearby land use and public acceptance of new power generation facilities. However, air quality permitting could present problems because of emissions produced by existing facilities, and because of the Class I air quality status of the Chassahowitzka Wilderness Area located 21 kilometers (13 miles) south of the site.

Anclote

The Anclote site is located in the extreme southwest portion of Pasco County on the north shore of the Anclote River estuary. Florida Power presently operates an oil-fired power generating facility at this site. A new power plant at the site probably would require saltwater cooling towers. Barge access to the site is possible, but docking and unloading facilities would have to be constructed. The principal advantage is its proximity to the Pinellas County load center and existing transmission facilities. The major disadvantages are water supply, limited land area, proximity to urban development, and existing air quality problems.

Phosphate Mining Area

The site is the 4,500-hectare (11,000-acre) International Minerals Corporation property located 8 kilometers (5 miles) southwest of Bartow in the Polk County phosphate mining zone. This alternative has the potential of reusing two valuable resources: (1) land that has been severely disrupted by mining; and (2) water from the City of Tampa sewage disposal plant. Wastewater could be pumped to the site via a 64-kilometer (40-mile) pipeline. Development of this site would involve little impact on terrestrial ecosystems, although pipeline construction could have significant impacts. The site has good highway and rail access, but no direct barge access. The location is highly favorable with regard to future power demand. Wastewater disposal at the site could present problems, given the contaminants present in the sanitary effluent used for cooling. Air quality would represent perhaps the most serious problem at the site, because of existing degradation related to the phosphate industry.

Lake Jessup

The Lake Jessup site is located in Seminole County on the southeastern shore of Lake Jessup about 19 kilometers (12 miles) northeast of Orlando. Municipal wastewater from two City of Orlando sewage treatment plants is available for cooling system makeup. The site is moderately favorable in terms of highway and rail transportation, but barging of coal may not be feasible. The site is fairly well located relative to Florida Power's load centers. Disposal of concentrated wastewaters from a power plant could pose significant problems. The Lake Jessup site is as favorable as any other site in terms of air quality considerations.

DeBary

The DeBary site is located on the east bank of the St. Johns River in Volusia County near the town of DeBary. Since 1976, Florida Power has operated a 336-Mw combustion turbine plant at the site, and more than 1,250 Mw of additional generating capacity are located in the vicinity. The DeBary site is favorable in terms of transportation since a rail line crosses the site, and barge access is possible via the St. Johns River. Barge traffic and disposal of wastewater into the river could have significant impacts. The DeBary site is well-situated relative to anticipated Florida Power service area needs. A significant disadvantage is that a substantial area is subject to flooding under extreme conditions.

Water withdrawals from the St. Johns River could involve alteration of hydroperiod when defined in terms of extreme low flows of record, although the requirement for cooling system makeup would amount to only about 1 percent of the long-term average discharge of the river. The site is only moderately favorable in terms of air quality, due to existing power plants in the area.

Palatka North and Palatka South

Two sites in Putnam County near the City of Palatka were considered in the final site evaluation; one about 8 kilometers (5 miles) northeast of Palatka and one approximately 5.6 kilometers (3.5 miles) southeast of the city. Both sites border the St. Johns River, and both would have the advantage of barge access and relatively low-cost rail transportation from points outside Florida. A major disadvantage is that use of either site would require construction of a transmission corridor exceeding 64 kilometers (40 miles) in length. The St. Johns River has adequate flow in this vicinity for cooling system makeup water, although entrainment of aquatic life could pose problems. The possibility of water quality and thermal impacts due to wastewater discharges also exists, given the present use of the St. Johns River for commercial and recreational fishing. Air quality conditions would be relatively unfavorable at Palatka North, but somewhat better at Palatka South.

SELECTION OF PREFERRED ALTERNATIVE SITES

The site selection process involved screening the 11 sites according to cost, followed by final selection based primarily on environmental considerations.

The cost comparison outcome was a grouping of sites into four categories. The "unacceptable" category (annual cost differentials of more than $15 million relative to Crystal River) contained the Gulf County and St. Marks sites. The two Levy County sites and the two sites near Palatka formed the "marginal" category (annual cost differentials of $7 million to $9 million). The "moderately favorable" category (differentials near $5 million) included the Anclote, Lake Jessup, and phosphate mining sites. The two "highly favorable" sites (zero cost differentials) were Crystal River and DeBary.

The two sites in the "unacceptable" cost category were eliminated from further consideration. The four sites in the "marginal" category were not ruled out on a cost basis alone, but subsequently were eliminated due to a lack of compensating factors and to serious liabilities.

Two of the remaining five sites were eliminated on the basis of "pairwise" comparisons. The Anclote site was judged inferior to Crystal River because of the severe physical limitations of the Anclote property, proximity to urban development, the less satisfactory transportation arrangements, and water quality sensitivity. Lake Jessup, likewise, was eliminated based on a comparison with the phosphate mining site. The problems involving land acquisition, land use compatibility, and possible water supply at Lake Jessup outweighed the air quality problems expected at the phosphate mining property.

The remaining locations, Crystal River, DeBary, and the phosphate mining site, were compared based on fresh and saltwater closed-cycle cooling options available at Crystal River. The three options were evaluated in terms of water supply, wastewater discharge, ambient air quality, and terrestrial ecology. Overall, new power plant facilities at Crystal River with saltwater cooling towers would have only one major liability--air quality--whereas the other options each would involve two or more general liabilities. The Crystal River site, therefore, was selected as the preferred alternative since all applicable air quality regulations could be met.

1.2.3 DESIGN ALTERNATIVES

The information contained in this section reflects the preliminary engineering design data available when alternatives were evaluated. Design information contained in Chapter 3 of the Technical Support Document is the most current data available for the proposed units.

PROCESSING ALTERNATIVES

Energy Source Alternatives

Coal is considered the best fuel alternative for steam electric generation at the Crystal River site. The availability of coal nationally on a long-term basis, higher efficiency of newer generation units, shorter lead time to on-line generation, and the existing coal handling facilities on the site, make coal-fired units the desired alternative. Florida Power has chosen low-sulfur coal (less than 0.6 pounds sulfur per MBtu) as the most economical fuel for the proposed units.

Alternative energy sources such as nuclear, reactivation of older units, or purchase from other sources were considered. Management alternatives were also considered.

Cooling System Alternatives

It is not possible to use all of the heat energy transferred from the fuel source to steam in the generation of electrical energy. Cooling systems considered to remove this excess heat from the plant site on a continuous and operational basis were: (1) once-through cooling,

(2) power spray modules, (3) natural draft wet cooling towers, (4) mechanical draft wet cooling towers, and (5) dry and wet-dry cooling towers. The reliability of each of these systems is high enough to make all of them technically feasible and available. Significant differences in cooling system operation and maintenance exist depending on the source of cooling water.

Studies associated with the three existing units have determined a number of impacts associated with once-through cooling. Generally, the major environmental effects of once-through cooling fall into three groups:

1. Impingement, or the impacts associated with screens which strain larger organisms from the incoming water--8 percent of biomass was determined to be of economic importance (Snedaker, 1972 to 1974);
2. Entrainment, or the impacts associated with passage through the power plant of organisms smaller than those affected by impingement--2,700 to 6,950 kilograms per day estimated biomass for Units 1, 2, and 3; and
3. Impacts associated with organisms which are exposed to the heated plume from the plant, i.e., lower productivities.

Other environmental alterations may be brought about by changes in existing circulation patterns and biocide treatments.

The general effects of cooling towers on the environment include: (1) fogging, (2) ice caused by cold weather fogging, (3) deposition of chemically-laden drift particles, (4) consumptive use of water, (5) climate modification due to atmospheric discharge of heat and water vapor, (6) effects on receiving water as a result of blowdown discharge, (7) acid rainout due to mingling of cooling tower and stack gas plumes, and (8) noise.

Comparative Analysis of Economic, Technical, and Environmental Considerations

Based upon economic and environmental factors, once-through cooling and natural draft (fresh and saltwater) cooling towers present the most favorable alternatives. Once-through cooling systems, however, process large volumes of water (high heat impact), have high impingement and entrainment rates, produce changes in circulation patterns, and require more biocide treatment. Economic costs are lower, partially due to less technical development.

Water Source Alternatives

Water source alternatives include fresh water for plant service use and salt water for cooling purposes. Freshwater source alternatives include: (1) Crystal River, (2) Withlacoochee River, (3) Lake Rousseau, and (4) freshwater aquifer (shallow wells). Saltwater source alternatives include: (1) Gulf of Mexico, (2) Withlacoochee Reach of Cross-Florida Barge Canal, and (3) saline aquifer (deep wells). Fresh water would be feasible only if cooling towers are used. The Gulf serves as a cooling source for existing Units 1, 2, and 3 which use a once-through system. Underlying the freshwater aquifer is water of higher salinity.

Site-specific estimates for the most apparent cost-effective source alternatives were developed. A relative ranking of alternatives according to lowest estimated cost (or in cited cases, speculated cost) is: (1) Gulf of Mexico, (2) Lake Rousseau, (3) shallow wells (freshwater), (4) Withlacoochee Reach of Barge Canal, (5) Crystal River, (6) Withlacoochee River, and (7) deep wells (saline water). The Gulf of Mexico as a source of cooling water is the cheapest alternative. There is a small energy penalty associated with using discharge water as cooling water, due to the necessity for precooling. However, capital costs for piping water from the existing discharge canal would be significantly lower than for other sources.

All water sources considered would exhibit some impacts if drawn upon by the proposed power plant. Impacts are intimately connected to the type of cooling system used; therefore, additional impact summary can be found in the alternative cooling system section. Impacts on water sources include: (1) entrainment of organisms, (2) impingement of organisms, (3) water use, (4) water quality, (5) water consumption, (6) circulation pattern alternation/disruption, (7) horizontal salinity intrusion, (8) vertical upwelling effects on quality, (9) lowering of surface water tables, and (10) construction impacts of intake structures. A summary of environmental assessments of alternative water sources is given in Table 1-2.

If salt water is used as a source for cooling, a separate freshwater source is needed for plant services such as: boiler makeup, ash handling, boiler tube lancing, and miscellaneous station needs. These sources are relatively small in comparison to condenser cooling.

Intake Alternatives

Cooling water intake locations were considered for Crystal River, Lake Rousseau, and the Gulf of Mexico. Crystal River was considered with an intake structure approximately 4 kilometers (2.5 miles) downstream (west) of the town of Crystal River. For Lake Rousseau, an area of the lake east of the Inglis Dam extending from the dam upstream about 2.4 kilometers (1.5 miles) was considered. Intake locations proposed for estuarine cooling water from the Gulf of Mexico are near the existing intake for the existing units. Drawing intake water for the proposed units from the discharge canal of the existing units to reduce impingement and entrainment was also considered.

Technical aspects of intake location include physical placement on shoreline, depth of placement, and type of structure required. Types of structures considered for surface water sources are: (1) conventional vertical traveling screens, (2) double-entry vertical traveling screens, (3) perforated pipe, and (4) double open water. Environmental considerations of intake systems include construction impacts; reduction or alteration of current patterns and velocities (siltation problems); impingement of marine algae and organisms; and navigational hazards. These impacts are considered to be potentially greater for Crystal River than for other surface water sources. Increased siltation can impact benthic organisms, and reduced river flow may have impacts on sessile, filter-feeding, and drifting organisms.

An intake placed in the existing discharge canal would reduce the impacts of cooling water withdrawal. Most of the water taken in would already have been entrained by Units 1, 2, and 3. In addition, the currents in the existing discharge canal would help to keep down impingement by sweeping the screens.

Water Discharge Options

Sources of water discharge include: (1) cooling water, (2) ash and sludge handling water, (3) rainwater runoff, (4) water pretreatment, (5) ion-exchange regeneration, (6) metal cleaning, (7) plant drains, (8) sanitary waste, and (9) boiler blowdown. Discharges into surface waters of the plant site and surrounding area could occur from all of the sources listed. Any discharge would be subject to compliance with existing effluent guidelines and water quality standards.

Considered alternatives can occur at several levels. Water discharge options can be (1) evaporative, (2) surface water, (3) ground water, and (4) recycle, or combinations of these. At this level of application, the existing alternatives are: (1) lining/no lining of ponds or retention basins, and (2) treatment/no treatment before discharge. A variety of technical variations on any of these options is feasible. Kinds of constituents that could potentially be discharged are given in Table 1-3.

Impacts from discharge of such constituents into surface and/or coastal receiving waters generally are related to human and organism health/toxicity, and ecological changes in production, structure or function. The trend is to avoid discharge to receiving waters as much as possible and apply dewatering (evaporative) and settling procedures. If accumulated solids are introduced into landfills, the potential for re-introduction of wastewaters into receiving waters is possible, depending upon subsurface flow conditions.

Air Emission Control Technologies and Evaluation

Sulfur dioxide control alternatives may be categorized as follows:

1. Burning of low-sulfur coal, whether naturally occurring or upgraded.
2. Burning high-sulfur coal with removal of sulfur dioxide from the flue gas. Flue gas desulfurization (FGD) can be accomplished through non-resource recovery methods or by regenerative processes.
3. Burning high-sulfur coal with removal of sulfur dioxide at the combustion stage.

Alternatives for the control of particulate emissions include electrostatic precipitation, fabric filtration, wet scrubbing, and mechanical separation. Electrostatic precipitation was chosen because high removal efficiencies could be achieved at the best cost/benefit ratio.

Control of nitrogen oxides (NO_x) from coal-fired power plants presently is accomplished by using low nitrogen fuel or by modified combustion techniques. Flue gas recirculation is considered ineffective as an NO_x control method when applied at coal-fired units. Reduced combustion-air preheating and steam or water injection are considered noncompetitive compared with the other alternatives.

Solid Waste Alternatives and Evaluation

Primary sources of solid waste are: (1) bottom ash from furnace, (2) fly ash from flue gas dust control equipment, (3) sludge disposal from non-regenerative sulfur dioxide removal system, (4) coal pulverizer rejects, and (5) facilities maintenance and operation wastes.

The expected quantity of solids for disposal based on both units operating will be approximately 784,000 kilograms (1,730,000 pounds) to 1,187,000 kilograms (2,620,000 pounds) per day, depending on average or peak generation.

Proposed disposal of both bottom ash and fly ash is by landfill; however, selling bottom ash for base material, aggregate, or grit is also proposed. Construction alternatives for the proposed disposal area were lining/no lining. Lining could be accomplished by either an impermeable clay layer or a PVC liner overlain with earth cover. Capital costs (1978) would be $958,320 for a clay liner and $1,742,400 for a PVC liner. Both liners would accomplish essentially the same purpose. Environmental impacts of an unlined pond would consist of ash leachate contaminants, such as iron and sulfate, formed by oxidation and reduction reactions taking place in the ash. Unlined ponds do not present as large a problem of stormwater runoff control as do lined ponds, due to exfiltration. A leachate testing and monitoring program is being performed to determine the best waste disposal strategy for the site.

If an FGD system is used, there is a potential for the generation of tremendous quantities of solid waste. Pond, landfill, and mine disposal alternatives are similar and all share potential problems with settling. Leachate problems must also be considered. Ocean disposal is a consideration but ocean floor sedimentation, suspended solids, high sulfates, COD wastes, and trace contaminants all present potential problems similar to those posed by leachate for the land disposal alternatives.

SELECTED ALTERNATIVES

Tentatively, the following alternatives were selected based on environmental and economic considerations:

	Selected Alternative
Cooling water source	Saltwater
Cooling water source location	Units 1, 2, and 3 discharge canal
Cooling water system	Natural draft cooling tower
Cooling water intake	Traveling screens
Plant service water source	Freshwater (ground)
Plant service water source location	Well field 5 miles east
Discharge location	Units 1, 2, and 3 discharge canal
Discharge methods	Neutralization and retention (10 yr/24 hr)
Particulate control	Electrostatic precipitator
Sulfur dioxide control	Low-sulfur coal
Nitrogen oxides control	Boiler controls
Solid waste handling	Dry handling; compaction

1.3 DESCRIPTION OF THE PROJECT AREA

1.3.1 WATER RESOURCES

The major surface water features in the proposed plant vicinity include the Withlacoochee River-Cross Florida Barge Canal complex to the north, Crystal River to the south, and the Gulf of Mexico to the west. Numerous small ponds and wet depressions, as well as several small unnamed intermittent streams, are scattered about the area. The major lake in the area is Lake Rousseau, an artificial impoundment on the Withlacoochee River.

There is no known consumptive use of fresh water from surface bodies in the project area. However, both freshwater and saltwater surface bodies constitute substantial recreational and economic resources for the region.

In 1976, total groundwater withdrawals in Citrus County totaled 87.8 million liters per day (23.2 million gallons per day). Approximately half of this amount is used for irrigation and only 14.9 million liters per day (3.9 million gallons per day) is used for municipal water supply purposes. There are no public water supply systems within an 8-kilometer (5-mile) radius of the plant site.

Surface water in the proposed plant site area is classified by Florida DER as Class III (Recreation, Propagation, and Management of Fish and Wildlife). There are no exceptions to the Class III water classification in the area of the proposed plant site.

The upper surface of the Floridan Aquifer, which would constitute both the potable water source for the plant and the receiving body for possible leachates, lies at a depth of 1.2 to 2.7 meters (4 to 9 feet) under the wellfield site and 0 to 1 meters (0 to 4 feet) under the plant site. In the vicinity of the wellfield, the confined Floridan Aquifer appears to be separated from the unconfined surficial (water table) aquifer by a somewhat impermeable layer.

Water from the Floridan Aquifer also discharges in an upwelling fashion in the coastal wetlands, estuaries, and springs of the region. Discharge of springs, such as those creating Crystal River, and the health and survival of the coastal forests are all dependent upon the flow of this aquifer.

Water quality in the Gulf waters of this area is relatively good, although some turbidity does occur at times of strong wind or tidal flows. Total solids are markedly lower in the discharge basin than at the mouth of the discharge canal. Nitrogen, chlorophyll a, and silica concentrations tend to increase near sources of freshwater or runoff inflow and/or following rainfall. Highest phosphorus levels are reached in the outer bay.

In the immediate vicinity of the proposed power plant site are three major aquatic-related habitat types: salt marsh, coastal hydric hammock, and freshwater marsh. The coastal zone is dominated by salt marsh. Within the salt marsh, *Juncus roemerianus* (black needlerush) and *Spartina alterniflora* (cordgrass) are the two principal floral types present. These grasses are of major importance in primary production, the initial link of any food web--the capture and conversion of energy from the sun to chemical-bond energy which, in turn, can be used by other organisms. There are two major food webs these grasses support; one involves those organisms which feed on the living plant (herbivores) and the second are those which feed on the detrital material produced by the plant (detritivores) (Keefe, 1972). The marsh also plays a major role as a nursery ground for fish and is an important habitat for various invertebrates, a major food source for some fish species.

Studies of impingement and entrainment due to the operation of Units 1, 2, and 3 show that the impingement of aquatic organisms on intake screens is a function of habitat, area, season, time-of-day, tide, and other factors. Results of the NUS studies conducted in 1977 and 1978 indicated that slightly less than 8 percent of the impinged biomass was composed of species of economic importance. NUS estimated that impingement at all three existing units amounted to about 0.5 percent of the number of blue crabs taken commercially in the Citrus-Pasco County area in 1976. Impingement of pink shrimp was estimated to be about 1 percent of the number caught commercially in the Citrus-Pasco County area. Information is limited concerning fishes and other nekton found in the discharge canal near the site for the new intake structure. The species composition of fishes appears to be less "rich" than in the existing intake canal, with a predominance of larger, schooling forms. The discharge canal constitutes a physical "dead end" for upstream swimmers.

The entrainment of plankton populations (i.e., organisms that are small enough to pass through intake screens) can involve several types of impacts: (1) loss of biological production; (2) alteration of the trophic structure of the biological community; and (3) losses of commercially important species that spend part of their life cycle as members of the plankton community. Studies of entrainment at Crystal River Units 1, 2, and 3 and at other power plants suggest that elevated temperatures may be more important than mechanical damage in producing zooplankton mortality, whereas the reverse may be true for young/small fish. Regarding temperature effects, the rate of change in temperature may be more significant to survival than the amplitude of temperature change.

The Florida manatee is classified as "endangered" on both state and federal lists. Personnel with the Gainesville Field Station National Fish and Wildlife facility have been collecting data concerning the presence of manatee over a larger area which includes the power plant site. The Gainesville Fish and Wildlife laboratory also collects the bodies of dead manatees which are found. No manatee bodies have been collected from the power plant area, nor have any of the bodies found in the Citrus County area shown signs of power plant-related injuries (Scott, 1978).

The alligator is classified as "threatened" on the federal list. A few alligators were sighted in the existing fly ash pond, but none were encountered in the other wetlands on Florida Power property.

1.3.2 AIR RESOURCES

The Florida Power site is characterized by dry winters and rainy summers, high humidity, and seasonal patterns of wind direction. The mean annual temperature is 21.0°C (69.8°F). In summer the climate is influenced primarily by sea breezes from the Gulf of Mexico and convective heating, while in winter, frontal activity dominates the weather.

Rainfall in the year 1975 was 1,078 mm at the site, with 62 percent of the rainfall occurring between June and September, when thunderstorm activity is at a peak. Thirty-year averages at nearby Cedar Key indicate that the mean yearly rainfall is 1,020 mm. Thunderstorms are the most frequent severe storms affecting the site, occurring on an average of 80 days per year, nearly 60 percent of which occur from June through August.

On an annual basis, winds at the site prevail from the east to east-northeast. However, substantial seasonal deviations occur as appreciable sea breezes blow from the west and southwest in summer, and more northerly winds occur during frontal activity in the cooler months (see Figure 1-5).

The ambient air quality of an area can be described in terms of quantitative standards. These standards, called Ambient Air Quality Standards (AAQS), were promulgated by regulatory agencies to protect the health and welfare of the general public. The major AAQS's to be evaluated for a fossil-fuel-fired steam electric plant, located in a rural area, are those for total suspended particulate matter (TSP) and sulfur dioxide.

Monitoring results at four stations ranging from about 5 kilometers (3.1 miles) to 14 kilometers (8.7 miles) indicate that both TSP and sulfur dioxide levels are currently within AAQS standards, and that any new sources of air emissions would have a considerable margin of compliance.

References to "endangered" and "threatened" species: Refer to federal publications (United States List of Endangered Fauna, 1974; Threatened Wildlife of the United States, 1973; Endangered and Threatened Wildlife and Plants, 1977) and the proposed listing (Proposed Endangered Status on Some 1700 U.S. Vascular Plant Taxa, 1976); and state publications (Florida Game and Freshwater Fish Commission, 1974; the Florida Committee on Rare and Endangered Plants and Animals, 1976).

Air quality dispersion modeling was performed to establish baseline levels for sulfur dioxide and TSP to meet the requirements for Prevention of Significant Deterioration (PSD). This baseline determined the maximum (highest) possible concentrations which currently would exist, including the fossil fuel-fired units, Crystal River Units 1 and 2. Baseline concentrations for the annual average, 24-hour and 3-hour periods at the plant site and at the Class I area Chassahowitzka National Wilderness Area are shown in Table 1-4.

1.3.3 LAND RESOURCES

The geomorphology of the proposed plant site area is defined by two well-developed coastal marine terraces which parallel the coast and mark the landward extent of two Pleistocene seas, the Pamlico and Wicomico, with shorelines at the 7.6-meter (25-foot) and 30-meter (100-foot) contours above mean sea level, respectively. The site is located within the Pamlico marine plain, which extends about 13 to 16 kilometers (8 to 10 miles) inland.

The surface of the proposed site is comprised of a thin layer (less than 3 meters) of sands (Broward-Boca Association) overlying a broad, greatly fractured limestone shelf which is the top of the Floridan Aquifer. The Floridan Aquifer is the upper sequence of rock formations underlying the study area and contains large volumes of fresh water, which give rise to numerous springs scattered throughout the coastal hammock, and feed most of the streams in the area.

The Floridan Aquifer in the study area is composed of the Ocala Group, Avon Park Limestone, and Lake City Limestone, with extensive solution cavities. The most extensive solution zones are in the Ocala Group and at the contact between the Ocala Group and the Avon Park Limestone.

Because of the thin soils, extreme flatness of the site, and the proximity to the Gulf of Mexico, the area is subject to flooding. The "mean annual flood" elevation is about 1 meter (3 feet) above mean sea level, and the 100-year flood elevation at the site is approximately 3.4 meters (11 feet) above mean sea level.

Figure 1-6 shows the present land use within an 8-kilometer (5-mile) radius of the proposed plant site. This 8-kilometer radius lies primarily within the unincorporated area of Citrus County, with only a small portion extending into the incorporated areas of Yankeetown and Inglis in Levy County. Present land use within a 6.4-kilometer (4-mile) radius consists largely of undeveloped areas (74 percent), about one-half of this area being the Gulf of Mexico. Pine plantation comprises 15 percent; other agriculture (mainly pasture), 5 percent; and residential and commercial uses combined, less than 1 percent. Industrial uses cover about 6 percent of the area, with the Florida Power Corporation property accounting for about 1 percent of the 6 percent, and the Cross Florida Barge Canal another 2 percent.

The present land uses of the area influence both the distribution and abundance of the vegetation and the wildlife. The primary natural factors affecting existing ecosystems are soil and moisture factors and the proximity to the coast (see Figure 1-7). Numerous areas occur throughout the Florida Power property where the top layer of limestone shelf has been dissolved or has subsided and left depression-like sinks up to two feet in depth. About half of the site has recently been timbered and is in an early successional growth. The remainder of the site has been modified by construction of logging roads, some land clearing, and construction of power line corridors; however, the extent of these disturbances is not considered irreversible.

Vegetation composition of the Florida Power property generally is typical of the region and includes freshwater marsh, pine plantation, pine flatwoods, upland and wetland hardwood hammocks, evergreen oak scrub, and ruderal (cleared) areas. The western section of the property is bordered by a belt of coastal hydric hammock, which is an extension of the coastal wetland forest south of the existing units. These forests have received the least disturbance of any in the area and are fairly old-age stands.

Most of the northern half of the site is slash pine flatwoods with scattered areas of evergreen oak scrub and small freshwater marshes. Most of the on-site pine flatwoods were cut over about 15 years ago. Natural reseeding in these areas has produced a young dense regrowth.

The southern half of the site is dominated by hammock communities of the southern mixed hardwood association (Monk, 1965). In these areas, a large amount of interspersion occurs between hydric and mesic hardwoods hammock. The hydric hammock variant occurs in areas where the surface layer of limestone has been dissolved or has subsided and has left depression-like sinks up to a few feet deep.

Of the wetlands occurring on the Florida Power property, the coastal hydric hammock and saltwater marsh which border the plant site to the west are of greatest value in a regional sense. No salt marsh is present on the proposed plant location. The coastal hydric hammock acts as a buffer system between the estuary and the upland terrestrial systems. During storm events and hurricanes, the hammocks reduce seawater flooding into inland areas. They also reduce sudden influxes of freshwater runoff into the estuary, thereby reducing salinity fluctuations.

The small pothole marshes on the site are associated with the surficial groundwater aquifer, so that flooding is a seasonal occurrence dependent upon rainfall levels. These marshes are generally small, isolated, and lacking the organic soils, productivity, and stability usually associated with wetlands. Consequently, they are of only localized value, and are less significant than the forested wetlands on a regional level.

The animal community of the property is characterized by ubiquitous types as well as a number of exclusives (species occurring in a single habitat). Ubiquitous forms (e.g., mourning dove, raccoons, and armadillo) occur throughout the site. Larger mammals such as white-tailed deer, feral swine, river otter, and gray fox are found in the vicinity and many utilize the various ecosystems.

The eastern indigo snake, classified as "threatened" on both state and federal lists, occurs locally in peninsular Florida. This snake occupies a wide variety of habitat types. The indigo snake is a species of high humidity requirements; however, it can survive in xeric environments if gopher tortoise burrows are present (Kochman, 1976).

During ecological surveys of these types of habitats on the property, the indigo snake was not observed; however, it has been reported to occur on the site. The proposed site is considered good habitat for indigo snakes because of the diversity of habitat, the numerous areas of thickets, brush piles, and other organic debris, and the apparently large populations of rodents and other herptiles.

The coontie, a plant listed as "threatened" on the state list, occurred in scattered locales in the hardwood hammocks on Florida Power property. The Florida Game and Freshwater Fish Commission reports this species is common to abundant in several habitats throughout the coastal part of the state.

The short-tailed snake is classified as "threatened" on the state list. The snake is a burrowing animal, seldom occurring above ground except during the spring and fall. In some instances, thermal stress caused by removal of overstory in sandhills communities has extirpated certain populations of this snake (Campbell, 1975). The only confirmed record of this species in Citrus County is several miles east of the proposed site in a more xeric habitat (Campbell, 1976).

Three other state "threatened" species (gopher tortoise, American osprey, and Florida mouse) are known to occur on the site. Eight active gopher tortoise burrows were found, six in the scrub and two in early successional communities. One osprey nest was located on the southwestern portion of the property. However, the dead tree in which this nest occurred has since collapsed due to decay. The Florida mouse was live-trapped in an evergreen oak scrub community.

1.3.4 HUMAN RESOURCES

The only incorporated areas lying within 5 miles of the proposed facilities are small portions of Yankeetown and Inglis, which are both located in Levy County. Construction and operation of the proposed facilities will have little effect on these two municipalities due to their small size and lack of any significant support services and facilities.

The effects of the construction and operation of the proposed facilities will be centered primarily in Citrus County, particularly in the area of the City of Crystal River, located approximately 8 miles (13 kilometers) southeast of the site. In the proximity of the proposed site, Crystal River is the only municipality of sufficient size to offer supportive services and facilities such as food stores, restaurants, gasoline service stations, retail shopping establishments, and housing.

Citrus County has been experiencing substantial population growth over the past 27 years, primarily due to in-migration. From 1960 to 1970, the population in Citrus County increased from 9,268 to 19,196 persons, representing an increase that is almost three times faster than the state's overall population increase of 37 percent during the same decade. Since 1970, Citrus County has been the fastest-growing county in the state in terms of percentage population change. Projections indicate that the county's population will reach 47,400 persons by the year 1980, 71,000 persons by the year 1990, and 82,200 persons by the year 2000.

The 5-mile (8-kilometer) radius area surrounding the proposed facilities currently is sparsely populated with small farms, a few clusters of mobile homes, and some single-family residences along the Withlacoochee River in the extreme northern fringe of the area. Based on a housing unit survey conducted in the area, no people were living within the 3-mile (4.8-kilometer) radius of the proposed site. It is estimated that approximately 500 persons presently reside within the 3- to 5-mile (4.8- to 8-kilometer) radius from the proposed stack locations.

Employment in the county is concentrated primarily in the service-related industries, wholesale and retail trade, government, miscellaneous services, and construction. Although per capita income in the county has increased since 1970, income levels in the county are well below those in the overall state income levels (State of Florida, 1977).

The stretch of land between the north bank of the Crystal River and the south bank of the Withlacoochee River has a well-authenticated history. Shell mounds and artifacts found along both rivers and along the Gulf of Mexico coastline attest that the area was inhabited by the Timucuan Indians, possibly as early as 2000 BC.

No cultural or historical landmarks exist on the proposed plant location. All known archaeological sites on the plant property are shell middens ranging from possibly as early as 2000 B.C. to approximately 1000 A.D. and occur along the coastline and river banks of the northwestern and southwestern portions of the property (see Figure 1-8). These sites are recorded in the archaeological site files of the Florida Division of Archives. Of the 20 archaeological sites on the Florida Power property, only four are relatively close to the location of the proposed facilities. One site (8Ci105) is badly deteriorated such that it is no longer likely to yield any meaningful data (Hutto and Steinen, 1972), and no cultural artifacts were retrieved. Sites 8Ci108 and 109 both are very small, undisturbed middens, but yielded no cultural artifacts in the survey. Site 8Ci110 yielded only one artifact.

1.4 DESCRIPTION OF THE PROPOSED PROJECT

1.4.1 GENERAL SITE AREA

The proposed Crystal River Units 4 and 5 are to be 695-Mw (gross) coal-fired units lying north of existing Crystal River Units 1, 2, and 3. Cooling will be accomplished with saltwater towers (one tower per unit) using make-up water from the existing discharge canal. Figure 1-9 shows the location of the proposed units in relation to the existing units, and the details of the arrangement of Units 4 and 5 and associated facilities.

The total cleared area for Units 1, 2, and 3 is about 129 hectares (319 acres). About 135 hectares (333 acres) will be cleared for the construction of Units 4 and 5. The cooling towers will be located west of the units. Existing coal handling will be expanded, and a storage area east of the proposed units will be constructed. Solid waste products (ash) will be stored in an area located east and southeast of the proposed units.

Plant complex buildings will be similar architecturally to Units 1 and 2. The steam generator will be partially enclosed within a building while the turbine will be completely enclosed. When Units 4 and 5 are completed, there will be four stacks on the site. The stacks of Units 1 and 2 are about 152 meters (500 feet) high, while those proposed for Units 4 and 5 will be about 183 meters (600 feet) in height. The cooling towers will be about 134 meters (440 feet) tall and 113 meters (370 feet) in diameter.

CONSTRUCTION

The 135 hectares (333 acres) of land cleared for construction of Crystal River Units 4 and 5 will include the permanent ash storage area and rail spur. Approximately 0.6 meters (2.0 feet) of organic muck and silt overburden will be removed in the vicinity of these structures, and roughly 140,000 cubic meters (180,000 cubic yards) of limestone fill will then be added. The plant area will be raised approximately 1.5 meters (5 feet) to an elevation of 3.4 meters (11 feet) above mean low water. The plant foundation will be supported by approximately 1,570 drilled piers of reinforced concrete. A small amount of dredging [less than 125 cubic meters (160 cubic yards)] will be required in the existing discharge canal for construction of a saltwater make-up intake structure and a cooling tower blowdown structure.

A 48-month construction period for each of the two units is anticipated. Assuming a 24-month separation in commercial opening dates, the period of intensive construction activity (more than 100 employees) will persist for 5.5 years, during which time there will be an average of 664 construction workers on-site. Construction employment will exceed 1,000 persons for 1.5 years and will peak at 1,275 workers in early 1982.

The perimeter runoff collection ditch system will be constructed as soon as site work is initiated. A temporary drainage system will be provided and maintained in the vicinity of the generating complex and laydown area. This system will be designed to hold construction runoff until permanent drainage facilities are completed and operational. Detailed erosion and sedimentation control plans for the construction phase have been developed.

RAW MATERIALS HANDLING, STORAGE, AND TRANSPORTATION

The proposed design coal for Units 4 and 5 is an approximate 50/50 design blend of typical Appalachian and western coals. A portion of the coal, one million tons per year at 12,500 Btu/lb and less than 0.75 percent sulfur, has been contracted. At the rated gross output (695 Mw) and the design blend heating value of about 23,923 kilojoules (KJ) per kilogram (10,285 Btu per pound), the coal consumption will be approximately 294,000 kilograms (648,000 pounds) per hour per unit and 1,700,000 metric tons (1,870,000 tons) annually at a 0.66 annual average capacity factor.

Fuel oil (2,800,000 average gallons per year) will be used as auxiliary fuel for furnace warm-up and coal ignition during start-up. Diesel fuel and gasoline will be used to power the emergency fire pumps and mobile coal and ash handling equipment.

A portion of the coal will be delivered to the Crystal River site by train. This coal will be transported in 70- to 110-car unit trains with 100-ton capacity cars. Four to six trains per week will be required. Western coals will be transported by unit rail trains to the Mississippi River, by river barge to New Orleans, and by ocean-going barge to the

Crystal River site. Barge unloading facilities in existence at Crystal River will be used. An average of three barges per week will be needed. Auxiliary fuels will be delivered by truck or rail, depending on the supplier.

The proposed storage areas provide approximately 39,000 metric tons (43,000 tons) of active storage and 776,300 metric tons (885,000 tons) of inactive storage in an area of about 111,000 square meters (27.5 acres). An additional storage of 80,000 square meters (20 acres) will be located adjacent to the stacker-reclaimer system. Active storage will provide about an eight-day supply of fuel for both units generating at 90-percent capacity. Fuel oil storage will be in two steel, cylindrical-plate storage tanks located within two clay-lined areas north of Unit 4.

1.4.2 PROCESS AND COOLING WATER SYSTEMS

WATER SOURCES

Water required to operate Crystal River Units 4 and 5 will be drawn from ground water for plant service uses and from the Gulf of Mexico for cooling purposes. The peak water use occurs when both generating units are generating at 100-percent load factor and maximum atmospheric evaporative conditions exist [32.8°C (91°F) dry bulb temperature and 55-percent relative humidity]. Normal water use occurs when both units are generating at 66-percent load factor under average evaporative conditions [21.7°C (71°F) dry bulb temperature and 77-percent relative humidity]. Raw ground water for plant freshwater uses will be obtained from a well field along the Florida Power Central Florida transmission line right-of-way, 6 kilometers (4 miles) east of the plant complex. Seven wells are planned, based on the results of test drilling. Results from these tests indicate that four of the seven planned wells are adequate to supply the plant service water. The well field will meet the rules and regulations of the Southwest Florida Water Management District. Well water will provide plant service water and make-up to the ash handling system.

Make-up water for the cooling towers will be obtained from the existing discharge canal. The intake structure serving both units will be located on the north bank of the existing cooling water discharge canal. Views of the structure are presented in Figure 1-10. The structure will be designed to supply a constant flow of 4,289 dm^3/s (68,000 gpm).* It will be about 15.2 meters (50 feet) wide and will be divided into

3 cells. Each inlet cell will be equipped with a half-capacity 2,145 dm^3/s (34,000 gpm) pump*, a 4-meter (13-foot) traveling screen, and a high-pressure screen wash pump. Entrance water velocity at low water level and maximum flow will not exceed 0.15 meters (0.5 feet) per second. *(See Florida Power Corporation comment FPC-10 and EPA's response to FPC-10 in Chapter 4. See note on pagel-1.)

WATER TREATMENT

Ground water which has been lime-softened and chlorinated will be used as plant service water. Demineralized plant service water will be used as makeup to the condensate-feedwater-steam cycle. Demineralization will consist of ion exchange by three cation-anion exchanger pairs with degasification after the primary anion exchanger. A condensate polishing system is planned for removal of suspended and dissolved solids from the condensate. This system will consist of three mixed-bed (cation and anion) exchangers per generating unit.

CONSUMPTIVE USES

Consumptive use of fresh and salt water results from evaporation, blowdown, and drift from the plant processes, from storage losses in wastes, from steam-cycle losses, and from evaporation and exfiltration from impervious surfaces and storage areas. Projected water consumption is shown in Table 1-5.

COOLING SYSTEM

Each generating unit will have a main turbine and an auxiliary equipment cooling system with a common water system utilizing a natural draft cooling tower for heat dissipation. The main steam cycle for each unit will reject 3.5×10^{12} joules ($3,300 \times 10^6$ Btu) per hour, and the the auxiliary equipment will reject approximately 0.2×10^{12} joules (200×10^6 Btu) per hour at full-load operating conditions. Total heat load for both units at full-load operating conditions will be 7.4×10^{12} joules ($7,000 \times 10^6$ Btu) per hour.

Cooling tower blowdown (NPDES 009 and 010) will be taken from the cold side of the circulating water system and will be discharged directly into the existing discharge canal but downstream of the intake for the new units. NPDES numbers refer to discharge serial numbers as listed in the draft NPDES permit for Units 4 and 5.

Preliminary calcium hardness data indicate that the cooling towers can be expected to operate at 1.1 to 1.2 cycles of concentration. Makeup and blowdown in gpm(dm^3/s) for this range of operation are as follows:

	Normal (66% load)	Peak (100% load)
Blowdown	61,142 (3,856)*	56,727 (3,578)*
Makeup	68,000 (4,289)*	68,000 (4,289)*

Quality of the cooling tower blowdown will be approximately 1.2 times natural concentrations. The predicted temperature range of cooling tower blowdown will be 35.6°C (96°F) to 28.3°C (83°F) and 30°C (86°F) to 9.4°C (49°F) for summer and winter conditions, respectively. Maximum temperatures refer to 2-hour averages. *(See Florida Power comment FPC-10 and EPA's response to FPC-10 in Chapter 4. See note on page 1-1.)

CHEMICAL AND BIOCIDE WASTES

EPA has promulgated maximum allowable discharge standards for new steam electric power generating units (40 CFR 423). These regulations set forth specific discharge limitations for separate plant processes (e.g., cooling tower blowdown, low volume wastes). The parameters covered in this regulation are pH, suspended solids, and oil and grease for most processes. Metal-cleaning wastes and boiler blowdown have additional standards for copper and iron. Cooling tower blowdown standards cover residual chlorine and corrosion inhibitors.

Cooling tower blowdown will not contain chemical corrosion inhibitors or compounds containing toxic priority pollutants. Makeup water will be treated by an alkaline-organic phosphate method of conditioning that will conform to the following quality control limits:

pH	8.0 to 8.5
M-Alk as $CaCO_3$	200 mg/l
Calcium Hardness as $CaCO_3$	1,200 mg/l

A proprietary organic phosphate scale inhibitor will be used to prevent excess scale. A residual phosphate concentration of up to 10 mg/l will be present in the blowdown as a result of the phosphate scale inhibitor. Mechanical condenser tube cleaning systems will also be employed. Sulfuric acid treatment will be used periodically for descaling.

The circulating water will be shock chlorinated to control the growth of fouling organisms, algae, and bacterial slimes in the condenser and cooling tower. Shock chlorination will be limited to one to three periods per day per unit of chlorine solution feed. Actual solution feed will be limited to 20 minutes or less per period. The chlorine feed rates will be controlled to meet the NPDES limitation of 0.10 mg/l total residual chlorine in the blowdown, and/or dechlorination facilities will be required. (See Florida Power comment FPC-1 and EPA's response to FPC-1 in Chapter 4. See note on page 1-1).

The following is a summary of the anticipated chemical dosages for scale and biological control:

	Peak Operation		Normal Operation	
	kg/day	lb/day	kg/day	lb/day
Scale Inhibitor	5,121	11,289	3,118	6,875
Chlorine	212	466	212	466
66° Baume' Sulfuric Acid	Intermittent use to be determined based on operational experience.			

No additional treatment of cooling tower blowdown is planned prior to its discharge into the existing discharge canal.

Hydrazine, ammonia, and trisodium phosphate will be fed to Units 4 and 5 condensate-feedwater-steam cycles to minimize scaling and corrosion. Hydrazine consumption is estimated at 1.8 kilograms (4 pounds) per day at peak load and 1.4 kilograms (3 pounds) per day at normal load. Ammonia consumption is estimated to be 41 kilograms (90 pounds) per day at peak plant load and 27 kilograms (60 pounds) per day at normal plant load. Trisodium phosphate consumption is estimated to be less than 0.5 kilograms (1 pound) per day at all plant loads.

Wastewater resulting from metal-cleaning and low-volume wastes, and boiler blowdown containing principally phosphates, iron, copper, ammonia, suspended solids, and high pH, will be discharged to the plant drains collection pond which will not discharge to surface waters.

Water used to sluice and transport bottom ash and pyrites will be reclaimed where possible and recycled. Some water used in the system will evaporate or accumulate in the ash. Ash transport water will not be discharged to surface waters.

The plant service water pretreatment system will produce about 43.6 cubic meters (11,520 gallons) of wastewater per day. This wastewater will be pumped to the bottom ash dewatering equipment where the suspended solids will be separated from the fluid and disposed with the bottom ash solids to a landfill. The liquid portion will be used as make-up to the bottom ash sluice system. Water pretreatment wastewater will not be discharged to navigable waters.

Wastewater will also be produced from preoperational and operational metal cleaning. Preoperational metal cleaning will use acidic and alkaline chemicals. Acid metal cleaning will use a solution of hydroxyacetic-formic acid for the preboiler system and inhibited hydrochloric acid for the boiler system, a neutralizer step, and flushing with demineralized water. Alkaline metal cleaning will use a sodium phosphate solution and subsequent flushing with demineralized water. These processes will produce about 4,500 cubic meters (1,200,000 gallons) of wastewater over a period of several days to be discharged to the neutralization basin. Periodic metal cleaning will be performed at 3- to 5-year intervals. About 1,400 cubic meters (360,000 gallons) of wastewater will be discharged to the neutralization basin over a period of 5 days per event.

Condensate polishing system wastewaters will be similar to those produced in the demineralization system. These waters will also be routed to the neutralization basin and, after pH adjustment, to the plant drains collection pond.

Chemical laboratory wastes are expected to be less than 0.40 cubic meters (100 gallons) per day. The principal chemical reagents will include sodium and ammonium hydroxide; hydrochloric, nitric, sulfuric and ethylenediaminetetraacetic acids; and sodium carbonate. Chemical laboratory wastes will be collected and discharged to the neutralization basin.

Wastewater from the demineralization system will consist of unreacted sulfuric acid and sodium hydroxide, along with sodium and sulfate salts of the ions removed from the ion-exchange resins during regeneration. Wastewater is expected to average less than 1.0 liter per second. It will be routed to the neutralization basin where the pH will be adjusted to between 6.5 and 9.0. Neutralized water will then be discharged to the plant drains collection pond. There will be no discharge of wastewaters from the plant drains collection pond.

RUNOFF

Runoff from material storage areas (NPDES 011, 012, and 013) will be segregated from general site drainage and will only discharge runoff which exceeds storage pond capacity which is in excess of that produced by the 10-year, 24-hour storm event.

The proposed coal storage area will be diked and drained by a 1.2-hectare (3-acre) perimeter drainage ditch. The ditch will not be lined with impervious material. Stored rainfall up to 8.37 inches (10-year, 24-hour rainfall event) will be disposed of by evaporation and exfiltration. Rainfall in excess of the design criteria (NPDES 011) will be discharged to the runoff collection ditch system.

The active ash storage will be compacted and sloped to ensure minimum infiltration. A toe canal will be constructed along the perimeter of the active storage segment to receive surface stormwater runoff. Storage of the stormwater will be designed to retain a quantity of water in excess of the 10-year, 24-hour storm event. Water in excess of the design criteria will be diverted to the canal retention system (NPDES 012).

General site runoff will be segregated through a canal retention system. The system is designed to contain a quantity of water equivalent to a 10-year, 24-hour storm. A flow control structure (NPDES 013) with an overflow spillway will be provided.

Fuel-oil storage tanks will be diked sufficiently to contain the entire volume of the tank plus the quantity of rainfall resulting from a 10-year, 24-hour storm rainfall. The dike will be clay-lined and drained by a buried pipe. The truck unloading area will be drained to the dike. Oil-water separators will be used to recover any oil spills.

WASTE TREATMENT AND DISPOSAL SYSTEMS

Segregation and re-use of waste streams is the primary concept behind the design of the waste treatment and disposal systems for the proposed facility. Wastewater from the plant drains collection pond is used for ash dust suppression and compaction; low-volume wastes and metal-cleaning wastes are segregated and pretreated; material storage pile runoff is segregated from general site runoff; oil-water separators are used to recover oil spills, treat rainfall runoff, and pretreat process wastewaters.

A neutralization basin with a volume of 380 cubic meters (100,000 gallons) is planned for pretreatment of metal-cleaning wastes, ion exchange regeneration wastes, and laboratory drains. This basin will be used for neutralization of wastes on a batch basis. The basin will be sized to contain the largest volume of chemical cleaning solution wastes expected in one batch and will be constructed of reinforced concrete with a chemical-resistant membrane overlaid with acid-resistant brick and mortar. A mixer will be mounted on a walkway spanning the open-topped basin. Sulfuric acid and sodium hydroxide will be available from the demineralizer system regeneration equipment for neutralization of basin contents.

Batch neutralization of preoperational chemical-cleaning wastes will produce approximately 3,200 kilograms (7,000 pounds) of precipitated metal hydroxides. Acid cleaning will produce about 950 kilograms (2,100 pounds) of precipitate every 3 to 5 years. The neutralization basin will discharge to the plant drains collection pond. A determination will be made prior to discharge of metal-cleaning precipitates to the plant drains collection pond as to whether this material is hazardous. If it is determined that this material is hazardous, it will be disposed of in an approved hazardous waste landfill. If not hazardous, it will be discharged to the plant drains collection pond.

The plant drains collection pond influents will include neutralization basin wastewaters, steam-cycle liquid losses (leaks from pumps, piping, and valves in the cycle, plus boiler blowdown), and other low-volume wastes carried via the miscellaneous plant drains. The plant drains collection pond will not require chemical additions for further treatment of the wastewaters introduced. The plant drains collection pond is designed to contain all wastewater influents and direct rainfall. There will be no discharge from the pond, as evaporation and exfiltration exceed the wastewater influents and expected rainfall.

The sewage treatment plant will be an 11.3 cubic meter (30,000 gallon) per day, packaged, activated sludge unit which employs the extended aeration process method of treatment. The facility will be designed to achieve 90-percent reduction of BOD and suspended solids. Chlorine consumption is estimated to be 0.9 kilograms (2 pounds) per day. The secondary treatment effluent will be discharged to a percolation-evaporation pond. There will be no discharge to surface waters from this plant. The pond will have a capacity of 1.12 acre-feet. Waste sludge will be disposed of either off site by a contract service or on site in the ash disposal area.

1.4.3 SOLID WASTE DISPOSAL AND CONTROL

Bottom ash will be collected in a water-sealed hopper and hydraulically sluiced to an intermediate transfer tank. Coal pulverizer rejects (pyrites) will be collected in small hoppers adjacent to each pulverizer. The pyrites will be conveyed hydraulically from each pulverizer hopper to the same intermediate transfer tank used for bottom ash. The bottom ash and pyrites will then be pumped with centrifugal slurry pumps to the ash dewatering bins. The water pretreatment sludge will be pumped directly to the ash water settling tank. Fly ash will be conveyed by a vacuum system to a storage area located on the plant site.

Dewatered bottom ash (324,000 pounds/day), pulverizer rejects (103,000 pounds/day), economizer ash (65,000 pounds/day), pretreatment system sludge (1,500 pounds/day), and dry, precipitator fly ash (1,234,000 pounds/day) produced during the operating life of Units 4 and 5 will be transported by truck or conveyor to an on-site storage area. An average of 528 cubic meters (18,630 cubic feet) per day will be generated. The total storage development will consist of approximately 380,700 square meters (95 acres) at a total depth of 12 meters (40 feet). The storage area will be developed in eighty 8-hectare (20-acre) segements. Each segment will be filled to a height of 12 meters (40 feet) above existing grade. The storage pile slopes will be dressed with soil material of sufficient depth to support vegetation. At the time the segment is developed to design height, the top surface will be sloped for drainage, and dressed with soil materials.

The on-site ash storage area will be sufficient for the storage of all solid wastes produced for 24 years of the 30-year operating life of Units 4 and 5. This conclusion is based on the average generation capacity using the proposed design coal which is a blend of typical eastern and western coals. Fly ash from these units will be handled dry. This will allow sale of fly ash for such purposes as: mineral filler in asphalt paving, additive in concrete and concrete products Pozzolin insoil stabilization, raw material in lightweight aggregate, grouting agent, fill for development, and agricultural applications. If 26.5 percent of fly ash from Units 4 and 5 is sold, then the on-site storage area will be sufficient for the storage of all ash and pretreatment system sludge for 30 years operation at average capacity.

1.4.4 AIR EMISSIONS AND CONTROL

Each unit will burn approximately 294,000 kilograms (648,000 pounds) per hour of coal based on the typical coal analysis. Combustion at this load will produce approximately 3,277,209 kilograms (7,224,887 pounds) per hour of combustion gases which will consist primarily of nitrogen, carbon dioxide, water vapor, oxygen, particulate matter, sulfur dioxide, and nitrogen oxides. The major air pollutants emitted at peak load conditions are listed in Table 1-6.

CONTROL SYSTEMS DESCRIPTION

Oxides of Nitrogen Control

NO_x from Units 4 and 5 steam generators will be controlled to meet emission standards (0.7 pounds $NO_x/10^6$ Btu) by utilizing features to minimize NO_x formation during combustion. The large furnace and widely spaced burners increase the burner firing zone absorption area and decrease peaking combustion temperatures, thus minimizing NO_x formation.

Particulate matter generated during combustion will be removed in the electrostatic precipitator. At full load, the maximum design ash content of the coal, more than 99.6 percent of the fly ash will be removed from the combustion gases leaving the furnace. This level of control will achieve the emission standards of 0.1 pound particulate/10^6 Btu heat input and less than 20-percent opacity (except for 40-percent opacity for no more than 2 minutes in any hour).

A stack height of approximately 183 meters (600 feet) and a diameter of 6.86 meters (22.5 feet) for each unit is adequate to satisfy dispersion requirements. Each stack will be capable of discharging approximately 1,038 m^3/s (2,200,000 ACFM) of flue gas at 127°C (260°F) and 28.1 m/s (99.2 f/s).

The coal and ash handling system will generate particulate matter from handling western coal and dry fly ash. The major emission points will be the coal conveyor transfer points (2.5 pounds/hour), crusher house (1.7 pounds/hour), coal silos (2.1 pounds/hour), fly ash silos

(4.4 pounds/hour), fly ash vacuum pump discharge (0.6 pound/hour) and emergency reclaim hopper (0.8 pound/hour).

Coal transfer will be by covered conveyor from the existing coal handling area to Units 4 and 5 storage. At the storage area, coal will be blended and transferred to the crusher house by covered conveyor. A total of four transfer points is designed.

The fly ash will be handled dry to enable possible commercial sale. As a consequence, possible fly ash emission may occur in the storage and transfer. Two points of discharge that have been identified are the fly ash silo and fly ash discharge system.

Regulated emission limitations for coal and fly ash handling are contained in the EPA Regulation 40, Code of Federal Regulations, part 60 subpart Y, and the Florida Department of Environmental Regulations' rules contained in Chapter 17-2 FAC.

Control of dust will be accomplished using either of the following methods:

1. Dust suppression by application of a wetting agent,* or
2. Dust collection in a dry state by air transport to a bag filter unit.

Wetting agent dust suppression systems consisting of pre-engineered modules which incorporate both water handling components and automatic spray controls are available. A typical spray solution contains 3,000 parts of water to one part of an organic ether detergent. The rate of spray application is about 3.4 liters per metric ton (1.2 gallons per ton) of coal which increases total surface moisture by about 0.5 percent. (*See Florida Power comment FPC-12 and EPA's response to FPC-12 in Chapter 4. See note on page 1-1).

Dry dust collection is accomplished by removal of dust-laden air from enclosed transfer points into a duct system which terminates into a bag filter unit. The collection process creates a slight negative pressure within enclosed transfer points.

Bag filters operate by passing dust-laden air through a fabric at low velocity. Removal (99.9-percent efficiency) is obtained by buildup of a cake or mat on the fabric dirty air surface. Good collection efficiencies can be maintained for dust particle sizes to 1 micron and smaller.

Low-sulfur coal will be utilized to meet sulfur dioxide emission limitations of 1.2 pounds $SO_2/10^6$ Btu heat input. Sufficient space will be provided in the design for flue gas desulfurization (FGD) systems. The use of FGD will require a minimum of 800 additional acres for sludge disposal. In the event FGD is necessary, alternate sludge disposal sites will be provided.

1.5 ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES

1.5.1 WATER RESOURCES

CONSTRUCTION

Clearing, grading, and filling of the plant site area will decrease the percolation rate and thus increase storm runoff. A variety of mitigative measures will be employed to prevent sedimentation and turbidity effects, including the construction of detention ponds, diking of cleared and filled areas, and other state-of-the-art erosion control techniques such as berms, mulch, and sodding.

The small amount of dredging activity in the discharge canal will increase turbidity in the canal and adjacent areas, but this impact will be less than one month in duration. Construction may lead to some minor changes in surface water chemistry, such as increased pH and mineralization due to contact of runoff with the limestone fill, but there should be no violations of any promulgated water quality standards. Sanitary wastes at the construction site will be handled by portable chemical facilities and later by a sanitary sewage system (with secondary treatment and discharge to an evaporation/percolation pond). No point-source discharges will occur during construction. Other chemical and petroleum wastes will be disposed of in accordance with state and federal regulations. No environmental impacts are expected as a result of these waste disposal activities.

OPERATION

Cooling system blowdown (NPDES 009 and 010) from Units 4 and 5 will be released to the existing discharge canal at a rate of 3,578 dm^3/s (56,727 gallons per minute) during peak operating conditions and (61,142 gallons) per minute during normal operations.* This water will be diluted by once-through cooling flow from Crystal River Units 1, 2, and 3, so that the blowdown from Units 4 and 5 will amount to only about 8 percent of the total flow in the canal on the average. The blowdown constituents having potential for ecological impact will be chlorine,* organic phosphates, sulfuric acid,* and thermal loading. *(See note, page 1-1).

Shock chlorination of the cooling system will yield a total residual chlorine concentration in the blowdown which will not exceed 0.1 milligrams per liter at any one time, in compliance with the draft NPDES permit. Dechlorination facilities may be required. Instantaneous concentrations of total residual chlorine in the discharge canal at the edge of the 150-meter mixing zone are not expected to exceed the Florida Water Quality Standards criterion of 0.01 mg/l of total residual chlorine.* The use of an organic phosphate scale inhibitor will generate a phosphate residual in the blowdown of up to 10 parts per million. Periodic sulfuric acid treatment will be used for descaling. The required dosages and the resulting sulfuric acid concentrations in blowdown are unknown at present. (*See Florida Power comment FPC-1 and EPA's response to FPC-1 in Chapter 4. See note on page 1-1).

Although low chlorine concentrations can produce adverse effects on phytoplankton, it is expected to be low in both magnitude and significance. The phosphate residual and periodic sulfuric acid content of the blowdown are likewise expected to have negligible impact on aquatic ecosystems. An important factor in all cases is the very high degree of dilution received in the discharge canal. (See Florida Power comment FPC-2 and EPA's response to FPC-2 in Chapter 4. See note on page 1-1).

Six operational scenarios for the existing and proposed power generating units at Crystal River have been evaluated in order to establish the worst-case thermal effects and other impacts of blowdown from Units 4 and 5. Cooling tower makeup and blowdown are expected to yield a net increase in thermal energy (and therefore in temperature) in the discharge canal in the coldest winter months. During the hottest summer months, however, cooling tower makeup and blowdown should lower the temperature in the discharge canal (effect a net decrease in thermal energy) for all but one scenario. For five of the six scenarios, discharge canal temperature should neither be increased by any more than 0.83°C (1.5°F) in winter nor decreased by more than 0.44°C (0.80°F) during summer. The remaining scenario [with increases of 5.8°C (10.5°F) in winter and 2.1°C (3.7°F) in summer] involves a permanent shutdown of Units 1 and 2, and a temporary shutdown of Unit 3. The analysis thus indicates that the thermal impacts of Units 4 and 5 under steady state conditions will be insignificant for all but one scenario unless all existing units are inoperative. The design features (mitigative measures) responsible for achieving this result are the use of closed-cycle cooling, the reuse of cooling waters from Units 1, 2, and 3 as cooling tower make-up, and the withdrawal of blowdown from the cold side of the circulating water system.

Due to the location (on existing discharge canal), design (flush-mounted with canal wall, low intake velocity), capacity (cooling towers minimize usage), and construction plans (minimal dredged volume over a short time period with control of turbidity) of the intake system, EPA has tentatively determined that the proposed cooling water intake structure reflects the best technology available for minimizing adverse environmental impacts in accordance with Section 316(b) of the Clean Water Act.

Stormwater runoff exceeding the design criteria for the canal retention system (NPDES 011, 012, and 013) may be discharged into the discharge canal by a drop inlet structure with a skimmer. This overflow would contain runoff from the coal and ash storage areas. Violations of water quality criteria or impacts on aquatic ecosystems are not expected, however, because of the short duration of overflows, the dilution of runoff by rainwater, the treatment provided in the form of temporary detention storage, and the dilution of the ultimate effluent in the discharge canal.

Groundwater resources, and possibly surface waters, could be affected by leachate from the ash storage area, coal piles, plant drains collection pond, and/or the canal retention system. The potential for leachate contamination will depend upon the precise characteristics of materials present and other factors such as soil absorption properties, soil transmissivities, and groundwater flow patterns. Studies of coal pile runoff/leachate suggest that there may be elevated concentrations of acidity, suspended solids, total dissolved solids, iron, manganese, and various trace metals. Fly ash, which will constitute a major proportion of material contained in the ash storage area, is known to be enriched in a variety of metals. Some of the leached metals from fly ash may form insoluble precipitates, however, and others may be adsorbed by soils and thus not widely distributed.

A leachate testing and monitoring program is presently being conducted to evaluate adequate residual waste disposal strategies. Any leachates are expected to move west and south towards the Gulf of Mexico because of the natural flow pattern, but some movement in all directions around the storage areas may occur. Most outward movement is likely to take place at shallow depths (i.e., less than 15 meters [50 feet] below natural grade).

To mitigate potentially significant contamination of the groundwater regime, the permitting conditions require that all coal piles containing coal with a pyritic sulfur content greater than 0.2 percent be lined.

The cone of depression from pumping at the well field has been computed on the basis of available data in order to estimate the effect of groundwater withdrawal on the potentiometric surface of the upper Floridan Aquifer. The maximum estimated drawdown at the highest projected pumping rate is 0.76 meters (2.5 feet), which complies with the rules and regulations of the Southwest Florida Water Management District. Maximum drawdown at the property boundary of the FPC transmission corridor is expected to be approximately 0.53 meters (1.75 feet) at maximum pumpage. The cone of depression associated with normal usage of the well field would be substantially less pronounced, however, since the average pumping rate will be only one-fifth of the peak rate.

The proposed well field will have little effect upon overall groundwater availability in the area since the maximum pumping rate will equal only about 1 percent of the total flow to the Gulf of Mexico between Crystal River and the Withlacoochee River (Geraghty and Miller, 1977). Surface waters in the vicinity of the well field consist of karst-type depressions and scattered, small wet areas. The water surface in the area lakes and ponds is at approximately the same level as, or slightly above, the level of the Floridan Aquifer in the area. In the absence of clays or other low-permeability materials underlying these water bodies, their levels could respond to well field pumpage.

Impingement is expected to be much less for Units 4 and 5 than for the existing units because of the lower intake velocity and volume involved, and because the seaward current in the discharge canal will tend to limit the available species to the larger, faster-swimming fishes that can escape entrapment.

The zooplankton and fish eggs and larvae in the discharge canal will have already been subjected to a rapid temperature change of as much as

8°C. It is anticipated that nearly 100 percent mortality will occur among the individuals that are entrained by Units 4 and 5 and subjected to additional temperature stress (plus the effects of increased salinity and biocide use in the towers). One hundred percent mortality is also expected to occur for all fishes of unscreenable size that enter the Unit 4 and 5 intakes. The overall entrainment impacts of Units 4 and 5 are not considered significant.

The Florida manatee, a protected species, is thought to frequent the Withlacoochee and Crystal rivers. The only possibility of impact on the manatee population by Crystal River Units 4 and 5 would be the increased risk of injury to these animals by barge traffic in the intake canal or adjacent waters. This risk is considered low because of the relative infrequency of barge movements (roughly one arrival or departure per day) and the fact that the principal attraction of the plant area for manatees would be the heated discharge canal rather than the intake canal.

MONITORING

The water quality monitoring program will consist of sampling at the following five potential discharge sources during plant operation:

#009 and 010	Cooling Tower Blowdown, Units 4 and 5, respectively.
#011	Coal Storage Area
#012	Ash Disposal Area
#013	General Plant Runoff

Monitoring of the plant intake is also required. All sampling and analytical procedures will be those contained in 40 CFR 136. Locations of the discharges are as shown in Figure 1-11.

Groundwater monitoring is incorporated into a leachate monitoring and testing program designed to comply with requirements of the FDER Special Conditions of Certification, revised in May 1980, and the requirements of the EPA Environmental Impact Statement and draft NPDES permit for Crystal River Units 4 and 5. Although it is specifically concerned with leachate from the Units 4 and 5 ash landfill, the program will effectively monitor shallow ground water throughout the project site.

1.5.2 AIR RESOURCES

CONSTRUCTION

The most significant air pollutant generated by heavy construction operations will be suspended particulate matter, in the form of fugitive dust. The quantity of dust emitted will depend on a large number of factors. A general estimate of emissions is 3.0 metric tons per hectare (1.2 ton per acre) per month of activity (EPA, 1975). The majority of dust particles generated will settle near the source, although some will remain suspended. To mitigate fugitive dust impacts, Florida Power Corporation will take all reasonable precautions such as using water, oil, or dust-suppression chemicals where practicable on cleared areas and dirt roads.

Vegetative wastes from land clearing operations will be burned on-site. To limit air quality impacts, burning will be conducted only during periods of excellent atmospheric dispersion and will comply with other State of Florida regulations. Burning will emit particulate matter, carbon monoxide, hydrocarbons, sulfur oxides, and nitrogen oxides, in quantities that depend upon factors such as the moisture content and arrangement of the debris. The resulting impacts on air quality will be minor and short-term. Exhausts of heavy equipment and truck traffic will also constitute sources of carbon monoxide and other combustion products, but will have low importance because of the isolation of the construction site and the low volume of existing traffic on local roads.

Noise will be created during the construction project by the operation of heavy equipment on-site and by traffic to and from the project area. The distance from the center of the construction site to the nearest noise-sensitive receptors is approximately 8 kilometers (5 miles). This distance will reduce the maximum sound level to 39 dBA, and the intervening vegetation will cause a further reduction to 29 dBA, which is indiscernible. The corresponding Noise Pollution Level (NPL) will be 20 dBA below the maximum that is "clearly acceptable."

OPERATION

The analysis of air quality impact has been conducted as part of the Prevention of Significant Deterioration (PSD) review process. The PSD analysis of impacts on ambient air quality has necessarily considered two geographic areas: the vicinity of the Crystal River site, designated a Class II air quality area; and the Chassahowitzka National

Wilderness Area, which is located nearly 21 kilometers (13 miles) south of the site and is designated a Class I area. Because of the much smaller sulfur dioxide increments allowed at the Class I area (equaling 5 percent to 10 percent of the corresponding Class II increments), the PSD analysis for the Chassahowitzka National Wilderness Area has determined the overall fuel strategy to be utilized by Florida Power Corporation at Crystal River. This strategy will involve limitations on the sulfur content of fuels burned in the existing Crystal River Units 1 and 2.

The Class II PSD analysis indicates only small changes in the annual average sulfur dioxide and suspended particulate matter concentrations near the plant site between 1974, the baseline year, and 1984 with both Units 4 and 5 in operation. The greatest utilization of a Class II increment is the maximum 3-hour sulfur dioxide increase of 198 ug/m^3 which amounts to 39 percent of the allowable increment. All other increases and concentrations are well below the designated limits. In the Class I analysis pertaining to the Chassahowitzka National Wilderness Area, the maximum 3-hour sulfur dioxide increase is 25 ug/m^3, which exactly equals the allowable increment. This low level of increase is not expected to have detrimental effects on the ecology of the wilderness area. The other air quality measures again are well below the allowable limits. The PSD analysis thus demonstrates compliance with state and federal air quality regulations.

Coal handling and solid waste management activities are potential sources of particulate matter emissions in the form of fugitive dust. These sources are not expected to degrade air quality near the plant site, however, because of controls incorporated in the proposed facility design. Emissions from the transfer and processing of coal will be controlled by the use of wetting agents for open areas and bag filters for enclosed operations* (conveyors, transfer points, silos, and crushers). The use of sluices and pneumatic conveyance systems will minimize dust emissions from the handling of bottom and fly ash, and wetting agents will be applied during final disposal operations. *(See Florida Power comment FPC-6 and EPA's response to FPC-6. See note, page 1-1).

Cooling towers can cause fogging when water vapor emissions from a tower condense in the atmosphere. Modeling of meteorological conditions at the proposed plant site indicates that a potential for cooling tower induced fog exists approximately 344 hours a year. Because of prevailing winds during these periods, fog is most likely to occur in the southwestern quadrant from the cooling towers, and thus its impact will be directed primarily toward the Gulf of Mexico.

Fogging associated with the proposed Crystal River Units 4 and 5 is unlikely to have significant negative impacts on air or highway transportation. When it occurs, fogging will be highly localized, extending no more than 1.5 kilometers (0.9 miles) from each cooling tower. The only highway that could be affected other than the Florida Power access roads would be U.S. Route 19-98, which is located more than 5 kilometers (3 miles) east of the proposed plant site. The fog plumes will not reach a sufficient height to affect aircraft. Fogging could possibly affect water navigation on the Florida Power intake canal, however. It is projected that hazards can be kept to minimal levels through the exercise of prudent vessel control during the infrequent periods when fogging occurs.

The major noise sources associated with operation of the proposed generating facilities are the cooling towers, coal transfer and crushing operations, and turbine and boiler functions. The noise effects of the new facilities will represent increments relative to existing noise sources. The worst-case noise impacts of the new units have been computed on the assumption that a sound pressure level of 90 dBA will occur at a distance of 15.2 meters (50 feet) from the center of sound pressure at the project site. The impact at 6 kilometers (3.7 miles) from the site is estimated at 46 dBA, which is comparable to urban predawn background noise. There are presently only six occupied dwellings within this distance of the site, and little noise-sensitive development is expected in the future. For the areas closest to the site which might be expected to develop, the noise levels attributable to the proposed units would be eclipsed by traffic noise on U.S. 19-98. Thus, the noise effects of Units 4 and 5 are not considered a significant impact due to the lack of receptors near the plant site.

MONITORING

Three sampling stations are proposed as the construction and operation air monitoring network. These stations are the same as three of the baseline monitoring programs. Each station will measure ambient concentrations of total suspended particulate matter and sulfur dioxide (sulfur dioxide monitoring will be required only during operation). A minimum sampling will be scheduled once every sixth day, and monitoring will continue for the life of the units. The meteorological monitoring data available from the existing meteorological station will continue to be used by Florida Power.

1.5.3 LAND RESOURCES

CONSTRUCTION

The construction project at Crystal River will affect terrestrial ecosystems in two ways: loss of existing plant communities on 135 hectares (333 acres) of land at the plant site; and certain on- and off-site effects on wildlife. The plant communities lost will include 2.4 hectares (6 acres) of coastal hydric hammock, 22 hectares (55 acres) of hydric hammock, and 25 hectares (62 acres) of mesic hammock. The project will also take 60 hectares (148 acres) of slash pine flatwoods, 4.5 hectares (11 acres) of evergreen oak scrub, 10 hectares (25 acres) of freshwater marsh, and 11 hectares (26 acres) of ruderal land. In the early design stages of the project, the location of the plant site was shifted eastward to avoid substantial areas of coastal salt marsh, coastal hydric hammock, hydric hammock, and mesic forest. This design change is considered an important mitigative measure. Overall, the loss of natural vegetative communities is an impact of low significance because of the early successional status and disturbed state of most of the land to be cleared, and because the community types are widely represented in the region.

The disruption of vegetative communities at the construction site will affect wildlife populations directly and indirectly. The more motile species of wildlife (e.g., opossum, raccoon, and deer) will leave the immediate vicinity of construction, whereas the clearing process will destroy other populations such as small mammals and various herpetofauna. Since most lands in the vicinity are already at or near carrying capacity for wildlife, the animals displaced from the construction site will be forced to compete with established populations elsewhere. The long-term result is that regional wildlife populations will decline roughly in proportion to the reduction in habitat.

A biological opinion has been issued (March 16, 1979) by the U.S. Fish and Wildlife Service concerning the impacts of the Florida Power project on the eastern indigo snake and the Florida manatee. They concluded that "the siting of Units 4 and 5 is not likely to jeopardize the continued existence of the indigo snake or the habitat which has been determined to be essential to the species." The agency recommended that the manatee be protected by imposing navigation limitations on coal barge transport.

OPERATION

The artificial landform created by solid wastes should not detract from the aesthetic character of the area so long as the tree cover is maintained on land to the east. However, the ash storage will preclude many potential future uses of the land and will represent a long-term commitment of resources.

Solid wastes generated by the operation of Units 4 and 5 will include office wastes, trash, garbage, and scrap lumber and metal. Scrap lumber and metal will be recycled. Other wastes will be landfilled in approved areas near the new units, or disposed of by an outside contractor.

Some impacts on vegetation near the storage areas may occur if pollutants such as heavy metals reach the root zone. There could be reductions in plant growth, community productivity, and detrital production. If concentrations reach toxic levels, there might be an elimination of various floral components of the community, and a situation in which new seedlings could not become established. However, this eventuality is considered unlikely to occur over a large area, since leachate concentrations will decrease with distance and will be diluted by groundwater flow.

Heavy metals could pass into faunal organisms through ingestion of detritus or vegetation. Accumulation could occur at the higher trophic levels, although this effect would be insignificant for organisms with wide feeding ranges. Overall, the ecological impacts of leachate should have low significance because of the limited area of leachate interaction with surface conditions.

Salt drift from cooling towers that are fed by saline water involves the escape of drift droplets that contain roughly the same concentrations of chemicals as found in the circulating water. The drift is deposited in the form of droplets or solid particles, and leaves chemical precipitants on surfaces downwind from the tower. Salt drift from the proposed cooling towers should have minimal influence on off-site land uses because of the isolation of the site, but nearby vegetation could be affected. Based on mathematical modeling, the maximum salt deposition expected is 10.6 kilograms per hectare per month (114 pounds per acre per year), occurring at a point 0.3 kilometers (0.2 miles) west of the cooling towers. Salt deposition will exceed 2.6 kilograms per hectare per month (28.1 pounds per acre per year) on a total of approximately 200 hectares (500 acres) of land, but will become minor at distances greater than 1.3 kilometers (0.8 miles) from the towers. The most extensive study of vegetative response to salt drift identified only one species (dogwood) that was highly sensitive to drift conditions (Curtis, et al., 1976). Injuries occurred in about 5 percent to 40 percent of the leaves at a deposition rate of 20 kilograms per hectare per month (216 pounds per acre per year). The threshold leaf injury level was placed at 7.46 kilograms per hectare per month (80.6 pounds per acre per year) (Curtis, et al., 1978). Florida Power Corporation will conduct monitoring of salt drift to determine impacts.

There may be some possibility of injury to sensitive plant species at the Crystal River site due to salt drift, but widespread damage is unlikely. The experience of the two existing power plants in the United States with salt water cooling towers suggests that the significance of this impact will be low; however, monitoring of drift impacts is required by the NPDES permit.

Drawdown of the water table as a result of withdrawals at the proposed Florida Power Corporation well field could affect those biological communities associated with freshwater marshes. Present aquifer characteristics indicate a separation of water table and water source aquifers. However, changes such as transition from permanent marshes (pickerelweed, waterlily) to seasonally flooded marshes (smartweed, arrowhead, sawgrass) to wet prairies may occur where the water table drops below ground surface temporarily due to water withdrawal. The consequence would be changes in species composition, productivity, food web relations, wildlife habitat, and possibly habitat for rare and endangered plants (e.g. sundews). Minor effects on wildlife could result from a reduction in seasonal wetlands. If the character of the marshes and ponds is changed, a shift from aquatic species (turtle, pig frog) to prairie forms (cranes, rails) will occur. The significance of such changes will depend upon the area of wetland affected, which is presently uncertain. It appears likely that long-term changes such as those just described will be limited in extent and therefore low in overall significance because the drawdowns are predicted to be relatively small.

The existing transmission lines serving Crystal River Units 1, 2, and 3 at the site will be adequate to transmit the power generated by Units 4 and 5. The only additions necessary will be the interconnects from Units 4 and 5 to the existing site substation. Ozone generated by the power lines will not occur in sufficient ground-level concentrations to affect vegetation.

The operation of Crystal River Units 4 and 5 will involve an increase in "road-kills" of some wildlife species due to traffic on the access road. The effect on wildlife populations should be negligible, however. Air quality controls will prevent any damage to vegetation as a result of pollutant emissions at the site. The noise generated by power plant operation may cause some noise-sensitive wildlife species to avoid the area, thus reducing the range of these animals. This impact is considered low in significance due to the abundance of similar habitat elsewhere.

MONITORING

Selection of saltwater as the cooling medium vastly reduces the consumption of fresh water from nearby surface or ground sources and thereby reduces associated impacts. Groundwater monitoring will be required.

Salt drift originating from the natural draft cooling towers may impact the surrounding vegetation. Widespread damage is unlikely; however, a monitoring program to assess the impacts of salt drift will be implemented.

1.5.4 HUMAN RESOURCES

CONSTRUCTION

During the peak construction period, the project will generate approximately 2,000 trips by personal vehicles and 100 truck trips (equivalent to 50 round trips). U.S. Highway 19, which is four-lane near the project site, will be the major public roadway receiving this additional traffic. Except for some minor slowdowns caused by turning at the access road during peak hours, the additional traffic should have minimal effect on highway conditions, given the large excess capacity that now exists. Deliveries of materials to the plant site by rail will involve traffic stoppages on Route 19 of less than two minutes per arrival or departure.

Transient labor related to the project may place minor strains on the Citrus County community. One effect could be inflation in the price of rental housing. However, public facilities such as schools, hospitals, and water and sewer facilities appear adequate to serve the anticipated population influx. The construction of Crystal River Units 4 and 5 should have fewer adverse social effects than were produced by construction of Unit 3, since the scale of the local economy has increased and the construction activity will be more spread out over time. Given that the effects of Unit 3 were not serious, the social impacts of Units 4 and 5 should be of low significance. In particular, there should not be labor shortages during construction, or unemployment after the project. Substantial economic benefits will result from the wages paid to construction workers, which will exceed $75 million for the project as a whole, and the purchases of construction inputs from suppliers.

Many of the potential archaeological site locations considered for facilities associated with Crystal River Units 4 and 5 would have affected one or more of these sites. However, the layout ultimately chosen will restrict all construction activity to inland areas where there are no known archaeological sites. The proposed project thus will have no impact on archaeological/historical resources.

OPERATION

The operation of Crystal River Units 4 and 5 will yield substantial economic benefits to Citrus County. The operation and maintenance of Unit 4 will create 112 jobs with a payroll of $3,024,000 per year, and the start-up of Unit 5 will add 20 additional jobs and $420,000 in payroll. Starting in 1985, approximately $300,000 will be spent per year on contract labor and specialized labor services. Florida Power Corporation intends to utilize the local labor market to the maximum extent possible. Property tax payments to the Citrus County government will amount to approximately $2,900,000 per year for Unit 4 and $2,280,000 for Unit 5. These figures are averages for the first five years of operation beginning in 1983 and 1985, respectively.

The proposed power generating units are compatible with existing land use patterns in the area.

The proposed facilities will have a minor impact on transportation, in that traffic on U.S. Route 19-98 will be stopped to permit the arrival and departure of approximately one unit train per day. Each stoppage will require less than 2 minutes. Approximately three barges will arrive at the plant site per week to deliver coal for Units 4 and 5, which should have no impact on existing transportation facilities. The scenery of the site area will be altered slightly by the addition of the proposed power generating units, stacks, and cooling towers, which will be visible from some points on U.S. 19-98.

The proposed project will not affect existing recreational or cultural facilities. The site area to be developed is without notable scenic, recreational, historic, or cultural value. The lack of value for recreation is related to the absence of attractive beaches or convenient water access. The nearest cultural facility is the Crystal River Archaeological Site, which is located approximately 8 kilometers (5 miles) southeast of the power plant complex and which should not be affected by the two additional units. The proposed project should have no significant impacts on commercial or recreational fishing in the Gulf of Mexico.

MONITORING

During construction activities, normal archaeological monitoring and safeguards will be followed to protect possible discoveries. The state historic preservation officer will be notified if a potential historical site or find is discovered. Work will be stopped in the immediate area and will not be resumed until the approval of the Florida Division of Archives, History, and Records Management is received.

Table 1-1. Florida Power Corporation Sales Growth Rates

	Sales Growth Rates* (%)		
	1977-1987	1987-1997	1977-1997
Residential	4.91	2.41	3.54
Commercial	5.52	2.31	3.70
Industrial	5.64	2.83	4.31
Total (before Seminole adjustment)	5.59	2.56	3.97
Total (after Seminole adjustment)	4.29	2.43	3.26

*Growth rates are computed as compound annual percent changes.

Source: Florida Power Corporation, 1978.

Table 1-2. Environmental Assessment of Alternative Water Sources

Water Source	Advantages	Disadvantages
Gulf of Mexico through existing canals	1. Lower costs. 2. No consumptive use of fresh water for cooling. 3. If existing discharge canal is used as makeup, entrainment effects could be reduced.	1. Entrainment of important species. 2. Impingement of important species (for once-through or PSM). 3. If cooling towers are used salinity contributes to technical problems and larger volume of water needed than fresh sources.
Withlacoochee Reach of Cross Florida Barge Canal	1. Systems altered would be of lower value. 2. No consumptive use of fresh water for cooling.	1. Uncertainty of future plans for the area. 2. If cooling towers are used, a lower volume of water will be needed than for freshwater sources but technical problems may arise.
Crystal River	1. Water of lower salinity than above sources.	1. Consumptive use of fresh water. 2. Entrainment of important species. 3. Requires alteration of wetlands. 4. Percentage of water to be used is higher than for Lake Rousseau.
Lake Rousseau	1. Entrainment may be reduced by placing intake in waters of low biological productivity. 2. Percentage of water used is lower than at Crystal River. 3. May improve circulation in southwestern arm of the lake. 4. Dissolved solids lower than for Crystal River or well. fields would mean less water required for cooling towers.	1. Consumptive use of fresh water. 2. Potential for fouling problems from Asiatic Clam, Corbicula.
Well Fields	1. No entrainment or impingement.	1. Potential for salt water intrusion not clear. 2. Water availability not clear.

Table 1-3. Sources of Wastewater and Their Characteristics

Source	Volume	Content
Cooling blowdown, fresh water	3,400-11,000 cmd* (0.9-3 mgd)	pH 6-7, TDS, low level organic phosphates and chlorine
Cooling blowdown, salinity range	333,100 cmd* (88 mgd)	Salts 32-50 ppt, phosphates, chlorine
Demineralizer, condensate polisher	0.079 cmpm† (21 gpm)	H_2SO_4, N_2OH, concentrated minerals from freshwater inflow
Boiler cycle losses	0.31 cmpm† (81 gpm)	High pH but low poise, still rather pure water
Plant floor and equipment drains, all miscellaneous cleaning, etc.	0.19 cmpm† (50 gpm)	Oils, grease, pH, metals, phosphates, TSS
Roof drains	Average 0.08 cmpm† (Average 20 gpm)	TSS, rather clean
Ash handling if 20 acres, 680 GPM exfiltrates, net rain gain 12.4 GPM	0.07 cmpm† 18 gpm entrained in ash	TSS, pH, metals, oil and grease
Coal runoff--Area 1	Average 0.3 cmpm† (Average 80 gpm)**	TSS, pH, metals, oil and grease
--Area 2	Average 0.16 cmpm† (Average 43 gpm)	
Sewage	Average <0.05 cmpm† (Average <13 gpm)**	Nutrients, BOD, TSS
Metal cleaning	1,200,000 gallons at start up 360,000 gallons every 3-5 years	pH, TSS. oil and grease, metals

* cmd = cubic meters per day.
†cmpm = cubic meters per day.
** gpm = gallons per minute.

Source: Black and Veatch, 1976.

Table 1-4. Maximum Baseline Levels (Air Quality)

Pollutant	Location	Averaging Time		
		Annual	24-Hour	3-Hour
Sulfur Dioxide	Near Plant	5	46	583
	Chassahowitska Wilderness Area	1	30	95
AAQS for SO_2		60	260	1,300
Particulate Matter	Near Plant	30	32	NA
	Chassahowitska Wilderness Area	30	31	NA
AAQS for TSP		60	150	

Table 1-5. Projected Water Consumption

Source	Peak		Normal		Temporary Shutdown	
	dm^3/s	(gpm)	dm^3/s	(gpm)	dm^3/s	(gpm)
Sea Water	712	(11,293)	434	(6,878)	0	(0)
Fresh Water	34.2	(543)	24	(381)	4.8	(77)

Table 1-6. Combustion Products

Major Pollutant	Total (Units 4 and 5)	
	kg/h	(lb/h)
Sulfur Dioxide	5,760	(12,700)
Nitrogen Dioxide	4,236	(9,340)
Particulates	606	(1,334)

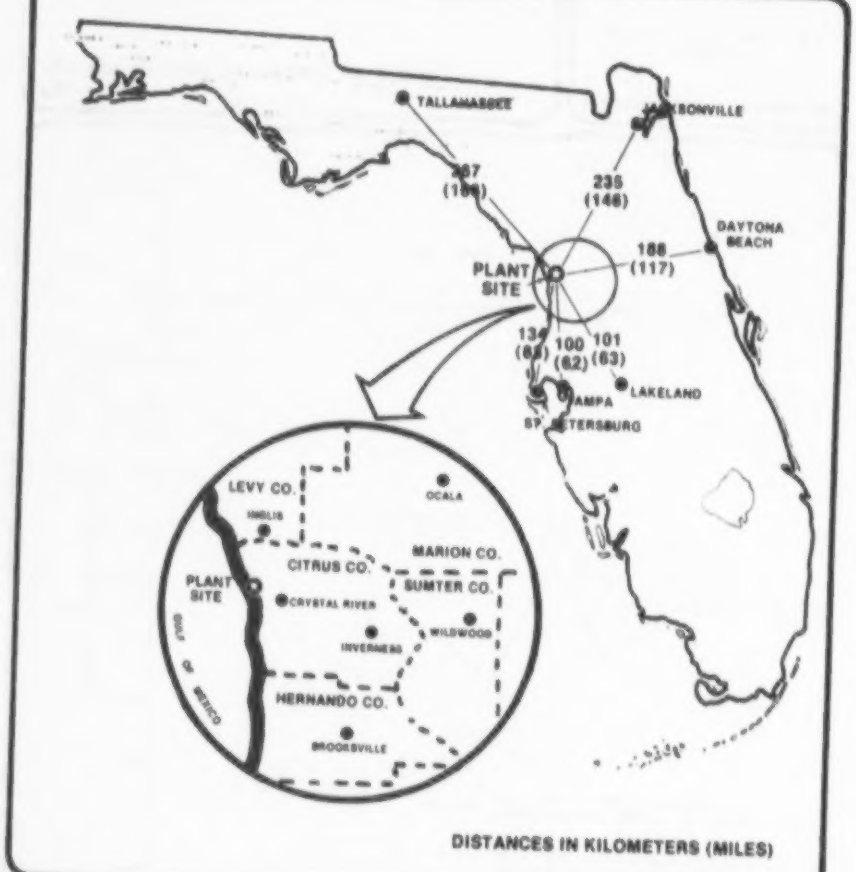

TALLAHASSEE
JACKSONVILLE
DAYTONA BEACH
LAKELAND
TAMPA
ST. PETERSBURG
PLANT SITE
287
235
(146)
188
(117)
134
100
(62)
101
(63)
LEVY CO.
INGLIS
OCALA
MARION CO.
CITRUS CO.
SUMTER CO.
PLANT SITE
CRYSTAL RIVER
INVERNESS
WILDWOOD
GULF OF MEXICO
HERNANDO CO.
BROOKSVILLE
DISTANCES IN KILOMETERS (MILES)

Figure 1-1
SITE LOCATION

SOURCE: ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1977

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

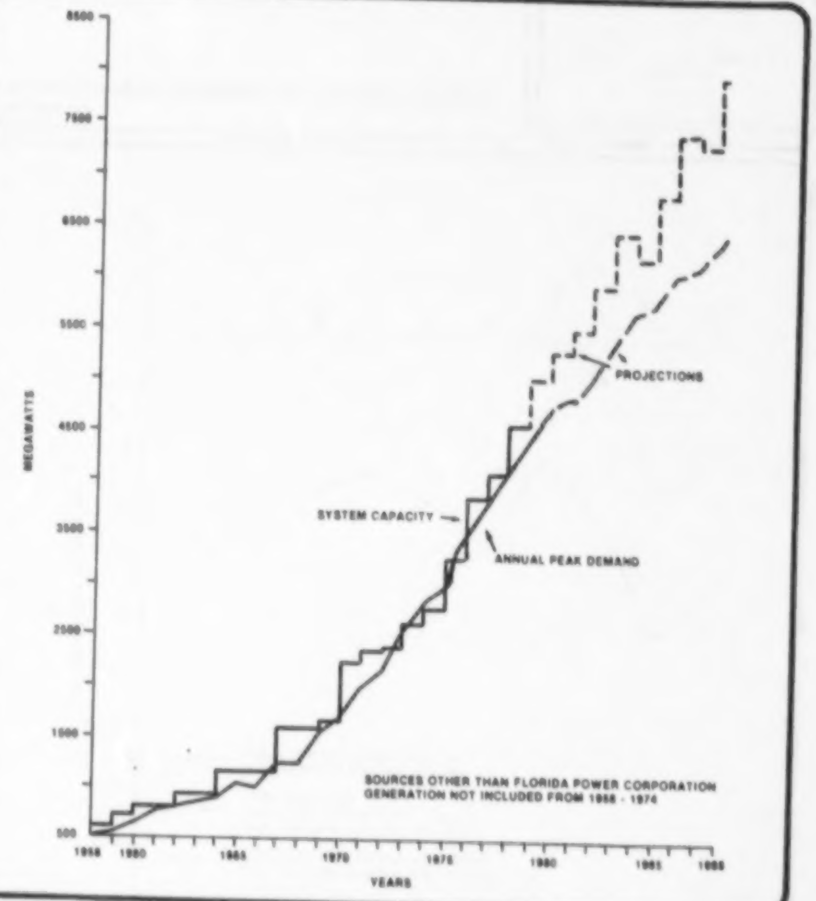


Figure 1-2
HISTORICAL AND PREDICTED PEAK DEMANDS AND AVAILABLE GENERATION CAPACITY OF FLORIDA POWER CORPORATION 1958 - 1988

SOURCE: FLORIDA POWER CORPORATION, 1980.

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

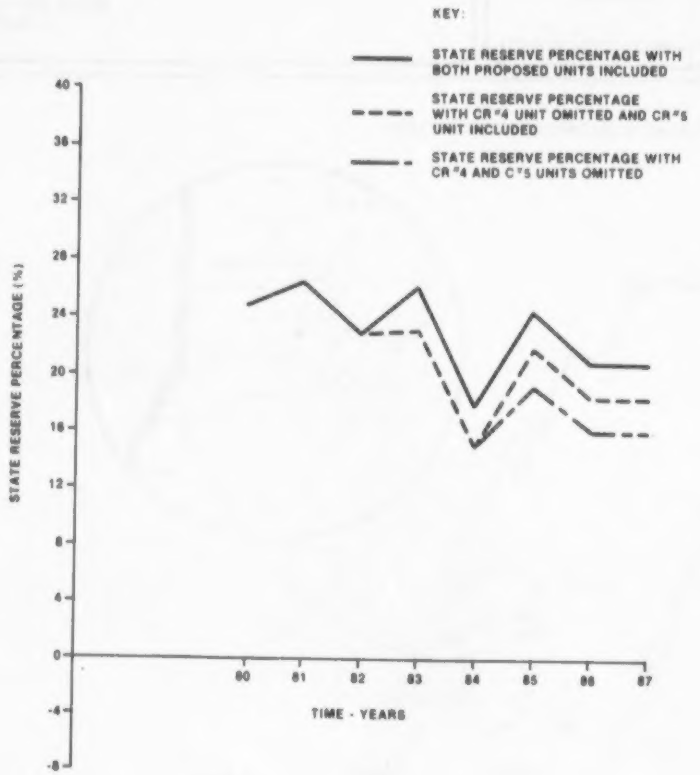


Figure 1-3
PENINSULAR FLORIDA PERCENT RESERVES

SOURCE: FLORIDA POWER CORPORATION , 1978

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

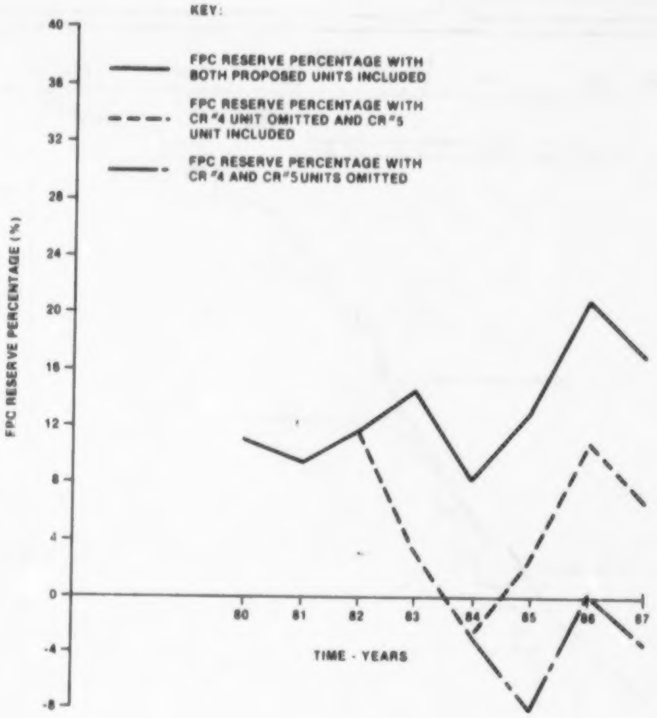


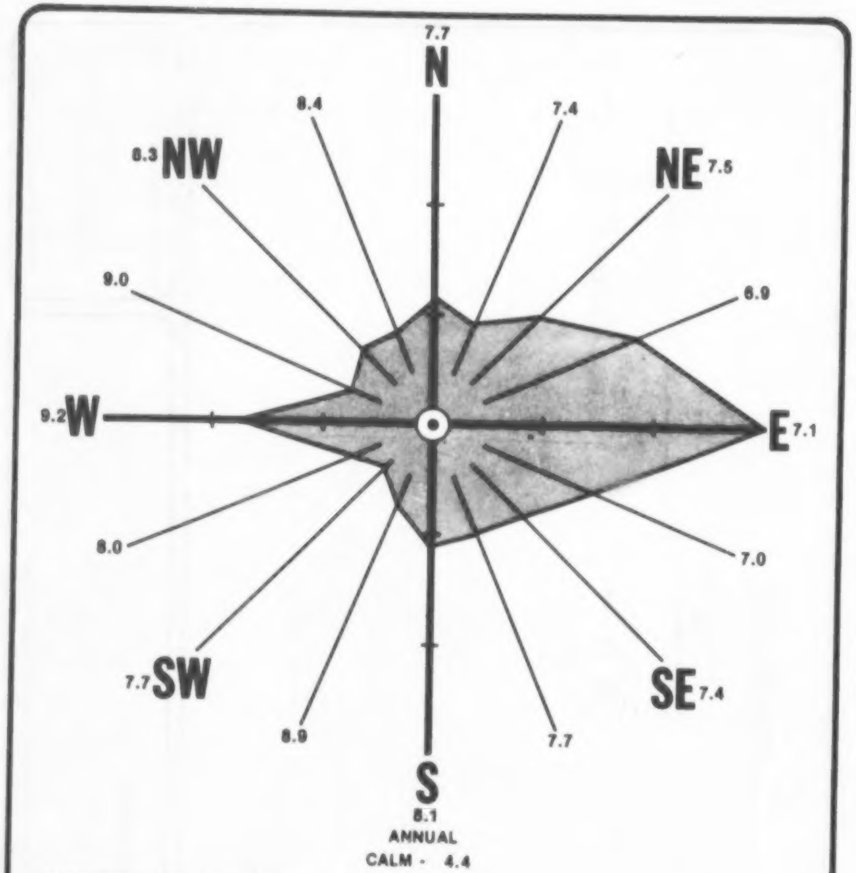
Figure 1-4
FLORIDA POWER CORPORATION PERCENT RESERVES

SOURCE: FLORIDA POWER CORPORATION, 1978.

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA



TICK MARKS ON ROSE REPRESENT 4%.
AVERAGE WIND SPEED IN KNOTS IS GIVEN FOR EACH WIND SECTOR.

Figure 1-5
ANNUAL WIND ROSE FOR TAMPA, FLORIDA,
1971 - 1975

SOURCE: ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1978

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

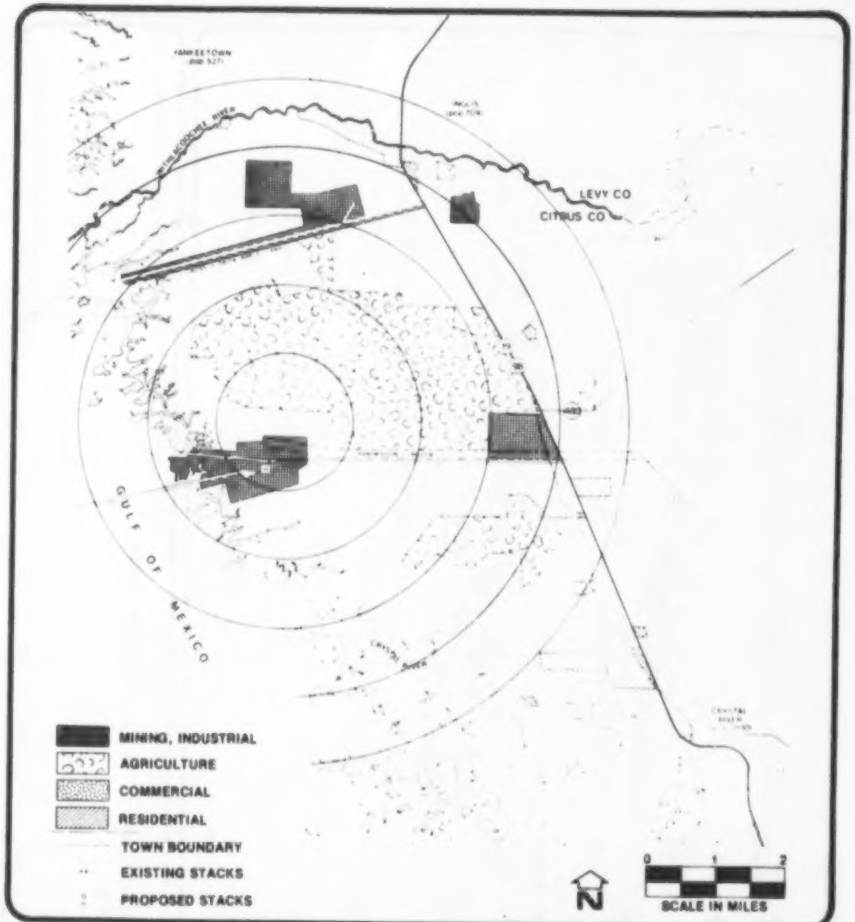

YANKEETOWN
WITHLACOOCHEE RIVER
INGLIS
LEVY CO
CITRUS CO
GULF OF MEXICO
CRYSTAL RIVER
CRYSTAL RIVER
MINING, INDUSTRIAL
AGRICULTURE
COMMERCIAL
RESIDENTIAL
TOWN BOUNDARY
EXISTING STACKS
PROPOSED STACKS
N
0
1
2
SCALE IN MILES

Figure 1-6
PRESENT LAND USE (5 MILE RADIUS)

SOURCE: WITHLACOOCHEE REGIONAL PLANNING COUNCIL
ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1977

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

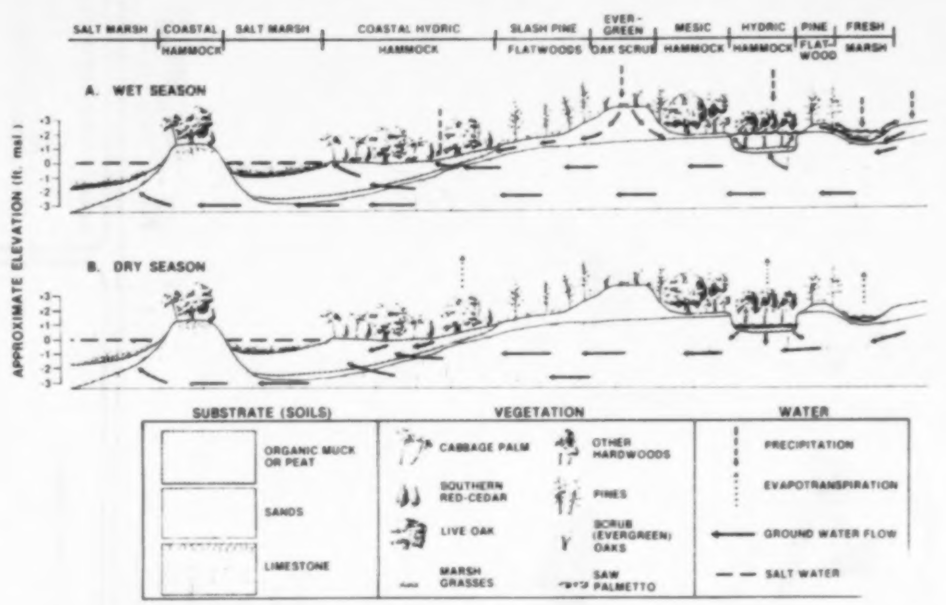

SALT MARSH
COASTAL HAMMOCK
SALT MARSH
COASTAL HYDRIC HAMMOCK
SLASH PINE FLATWOODS
EVER-GREEN OAK SCRUB
MESIC HAMMOCK
HYDRIC HAMMOCK
PINE FLAT-WOOD
FRESH MARSH
A. WET SEASON
B. DRY SEASON
APPROXIMATE ELEVATION (ft. msl)
+3
+2
+1
0
-1
-2
-3
SUBSTRATE (SOILS)
ORGANIC MUCK OR PEAT
SANDS
LIMESTONE
VEGETATION
CABBAGE PALM
SOUTHERN RED-CEDAR
LIVE OAK
MARSH GRASSES
OTHER HARDWOODS
PINES
SCRUB (EVERGREEN) OAKS
SAW PALMETTO
WATER
PRECIPITATION
EVAPOTRANSPIRATION
GROUND WATER FLOW
SALT WATER

Figure 1-7
CONCEPTUALIZED PLANT/SOIL/WATER RELATIONSHIPS OF THE PROPOSED PLANT SITE

SOURCE: ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1977

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

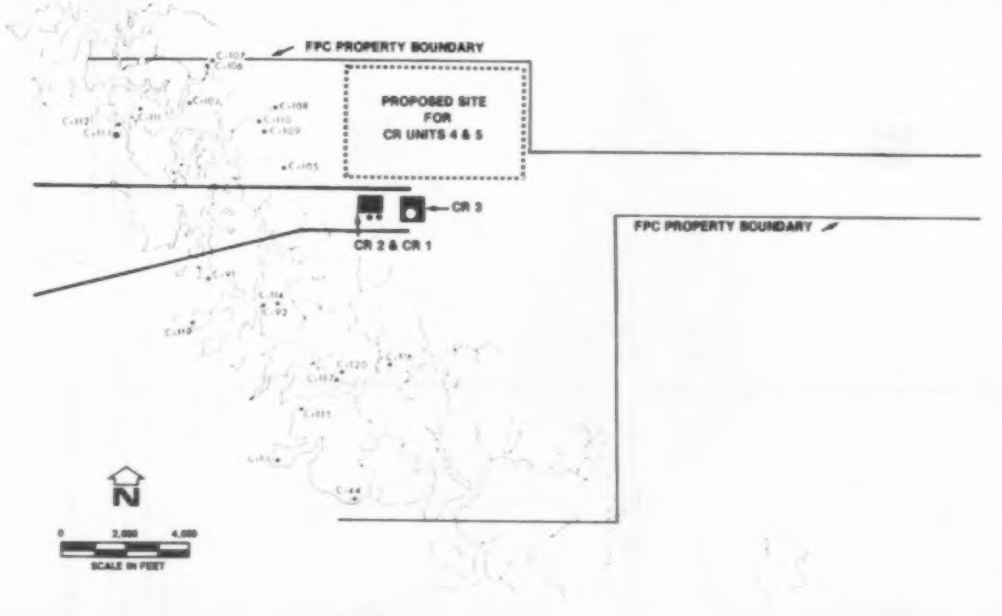

FPC PROPERTY BOUNDARY
C-107
C-106
C-108
C-110
C-109
C-105
PROPOSED SITE FOR CR UNITS 4 & 5
CR 3
CR 2 & CR 1
FPC PROPERTY BOUNDARY
C-91
C-114
C-92
C-120
C-44
N
0
2,000
4,000
SCALE IN FEET

Figure 1-8
ARCHAEOLOGICAL SITE INVENTORY

SOURCE: DIVISION OF ARCHIVES, HISTORY, AND RECORDS MANAGEMENT, 1972

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

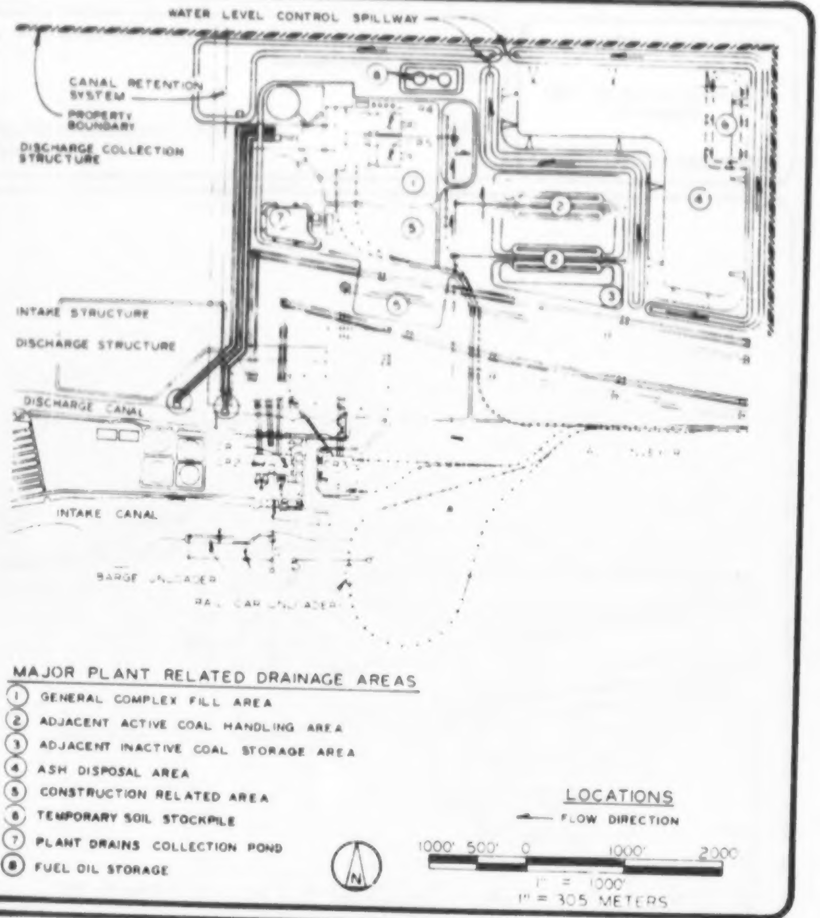

WATER LEVEL CONTROL SPILLWAY
CANAL RETENTION SYSTEM
PROPERTY BOUNDARY
DISCHARGE COLLECTION STRUCTURE
INTAKE STRUCTURE
DISCHARGE STRUCTURE
DISCHARGE CANAL
INTAKE CANAL
BARGE UNLOADER
RAIL CAR UNLOADER
MAJOR PLANT RELATED DRAINAGE AREAS
① GENERAL COMPLEX FILL AREA
② ADJACENT ACTIVE COAL HANDLING AREA
③ ADJACENT INACTIVE COAL STORAGE AREA
④ ASH DISPOSAL AREA
⑤ CONSTRUCTION RELATED AREA
⑥ TEMPORARY SOIL STOCKPILE
⑦ PLANT DRAINS COLLECTION POND
⑧ FUEL OIL STORAGE
N
LOCATIONS
FLOW DIRECTION
1000' 500' 0 1000' 2000'
1" = 1000'
1" = 305 METERS

Figure 1-9
UNITS 4 AND 5 SYSTEM LAYOUT

SOURCE: Black and Veatch, 1980

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

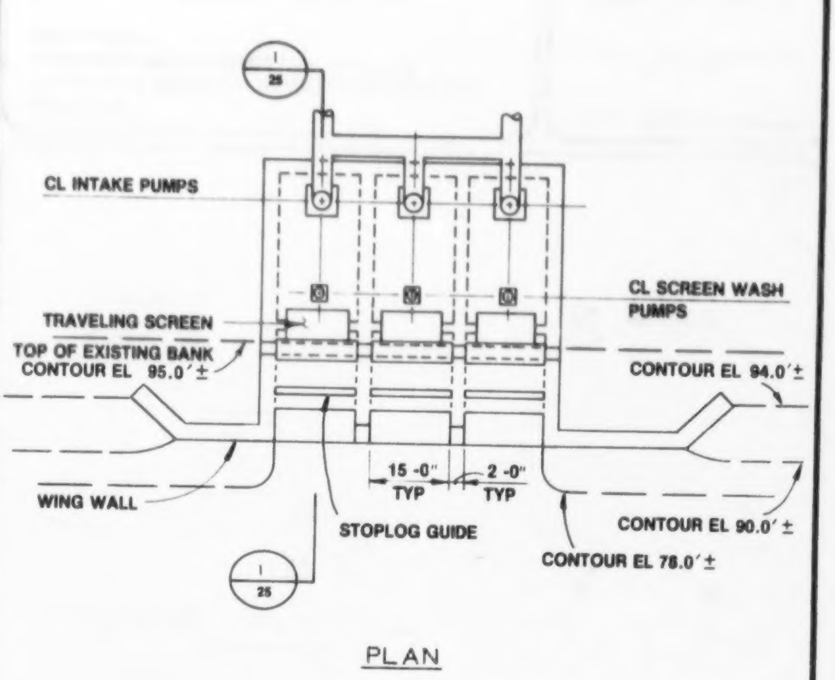

1
25
CL INTAKE PUMPS
CL SCREEN WASH PUMPS
TRAVELING SCREEN
TOP OF EXISTING BANK CONTOUR EL 95.0'±
CONTOUR EL 94.0'±
WING WALL
15 -0" TYP
2 -0" TYP
STOPLOG GUIDE
CONTOUR EL 90.0'±
CONTOUR EL 78.0'±
1
25
PLAN

Figure 1-10
COOLING TOWER MAKE-UP INTAKE STRUCTURE

SOURCE: BLACK AND VEATCH, 1980

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

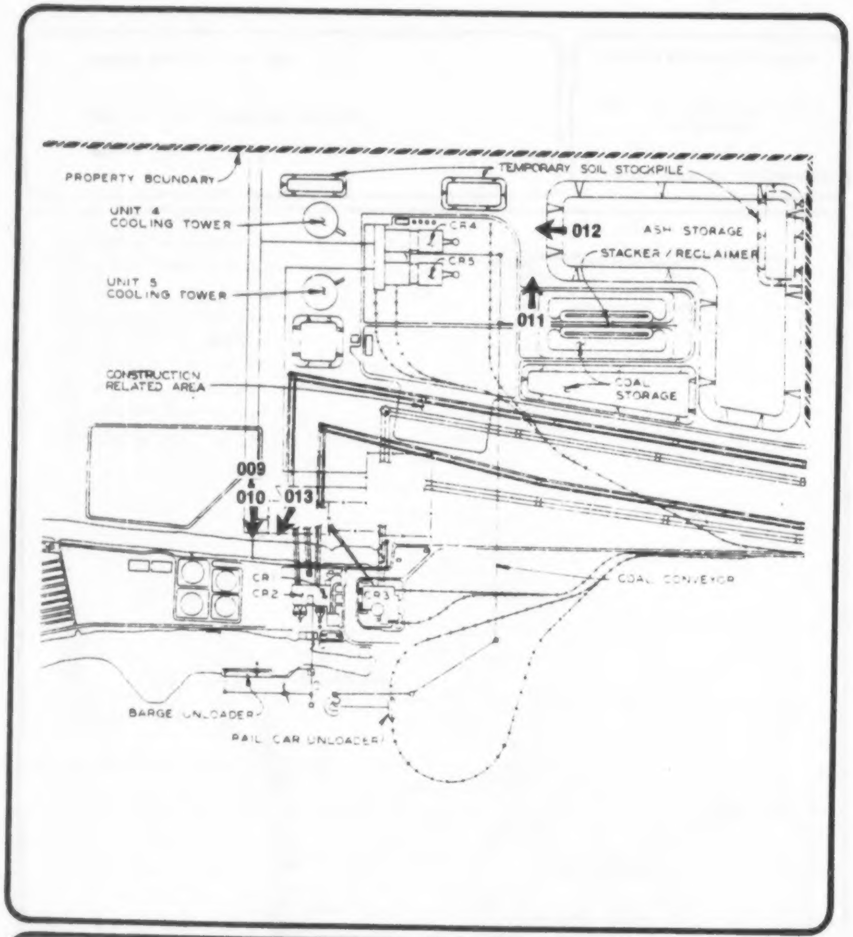

PROPERTY BOUNDARY
TEMPORARY SOIL STOCKPILE
UNIT 4 COOLING TOWER
UNIT 5 COOLING TOWER
CR4
CR5
012
ASH STORAGE
STACKER / RECLAIMER
011
COAL STORAGE
CONSTRUCTION RELATED AREA
009 & 010
013
CR
CR2
CR3
COAL CONVEYOR
BARGE UNLOADER
RAIL CAR UNLOADER

Figure 1-11
EFFLUENT SAMPLING LOCATIONS

N

0 1000 2000
SCALE IN FEET

SOURCE: BLACK AND VEATCH, 1980.

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

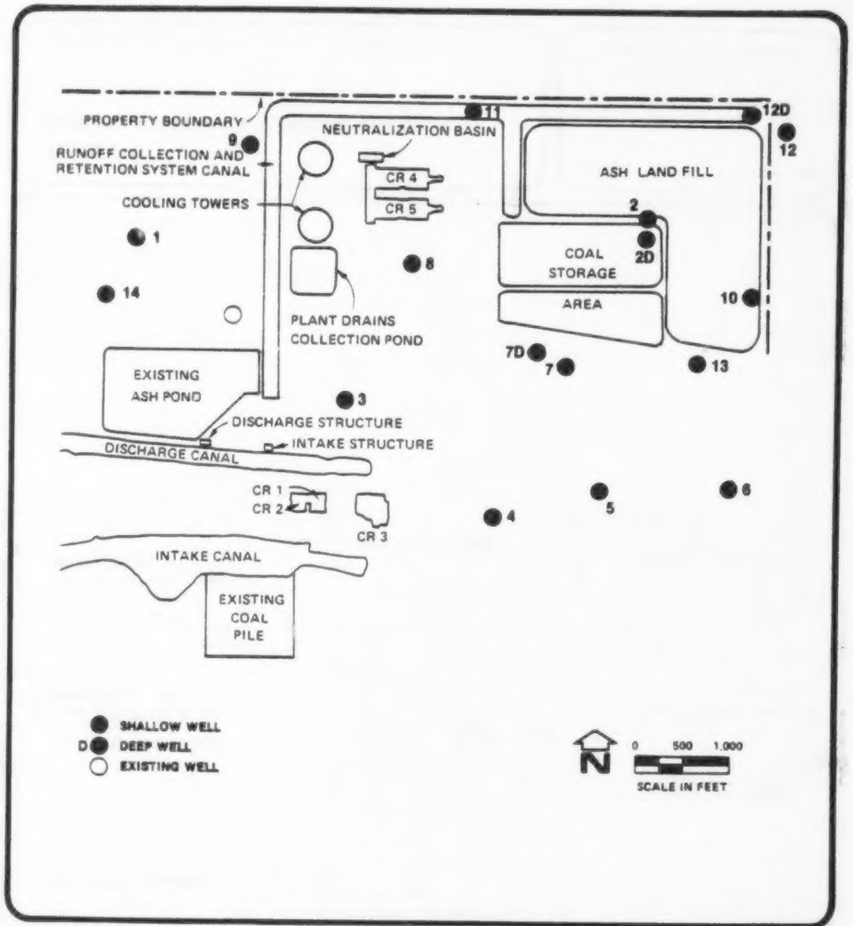

PROPERTY BOUNDARY
RUNOFF COLLECTION AND RETENTION SYSTEM CANAL
COOLING TOWERS
NEUTRALIZATION BASIN
CR 4
CR 5
PLANT DRAINS COLLECTION POND
ASH LAND FILL
COAL STORAGE
AREA
EXISTING ASH POND
DISCHARGE STRUCTURE
INTAKE STRUCTURE
DISCHARGE CANAL
CR 1
CR 2
CR 3
INTAKE CANAL
EXISTING COAL PILE
1
2
2D
3
4
5
6
7
7D
8
9
10
11
12
12D
13
14
● SHALLOW WELL
D● DEEP WELL
○ EXISTING WELL
N
0 500 1,000
SCALE IN FEET

Figure 1-12
LOCATION OF OBSERVATION WELLS FOR LEACHATE MONITORING PROGRAM FOR CRYSTAL RIVER UNITS 4 AND 5

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1980.

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

2.0 ERRATA

2.1 DRAFT ENVIRONMENTAL IMPACT STATEMENT

Page	Paragraph	Line(s)	Correction
ii	4	5	"A 50/50 blend" should be "A 50/50 design blend". NOTE: PSD approval requires an SO_2 emission limit of 1.2 lb/10^6 Btu to be met. A blend other than 50/50, i.e., 30/70, 60/40, etc., can also be used to meet requirements.
iii	2	2	"40 feet deep" should read "40 feet high."
iii	3	4	Second sentence should begin "The design sulfur content..."
I-1	1	9	Commercial operation dates should both be December.
I-29	1	4	Commercial operation dates should both be December.
II-57	Table 27		In the third group under "contents," N_2OH should be NaOH."
II-68	4	8 and 9	The costs quoted for clay liner and PVC liner are capital costs only.
IV-1	3	8 and 9	The steam generator building will be about 265 feet tall.
IV-5	3	1	FPC may receive coal from sources other than Appalachia.
V-9	Figure 23		See Figure 23-R. The following call-outs have arrows added to link them with the appropriate facility: DISCHARGE COLLECTION STRUCTURE, INTAKE STRUCTURE, and DISCHARGE STRUCTURE.

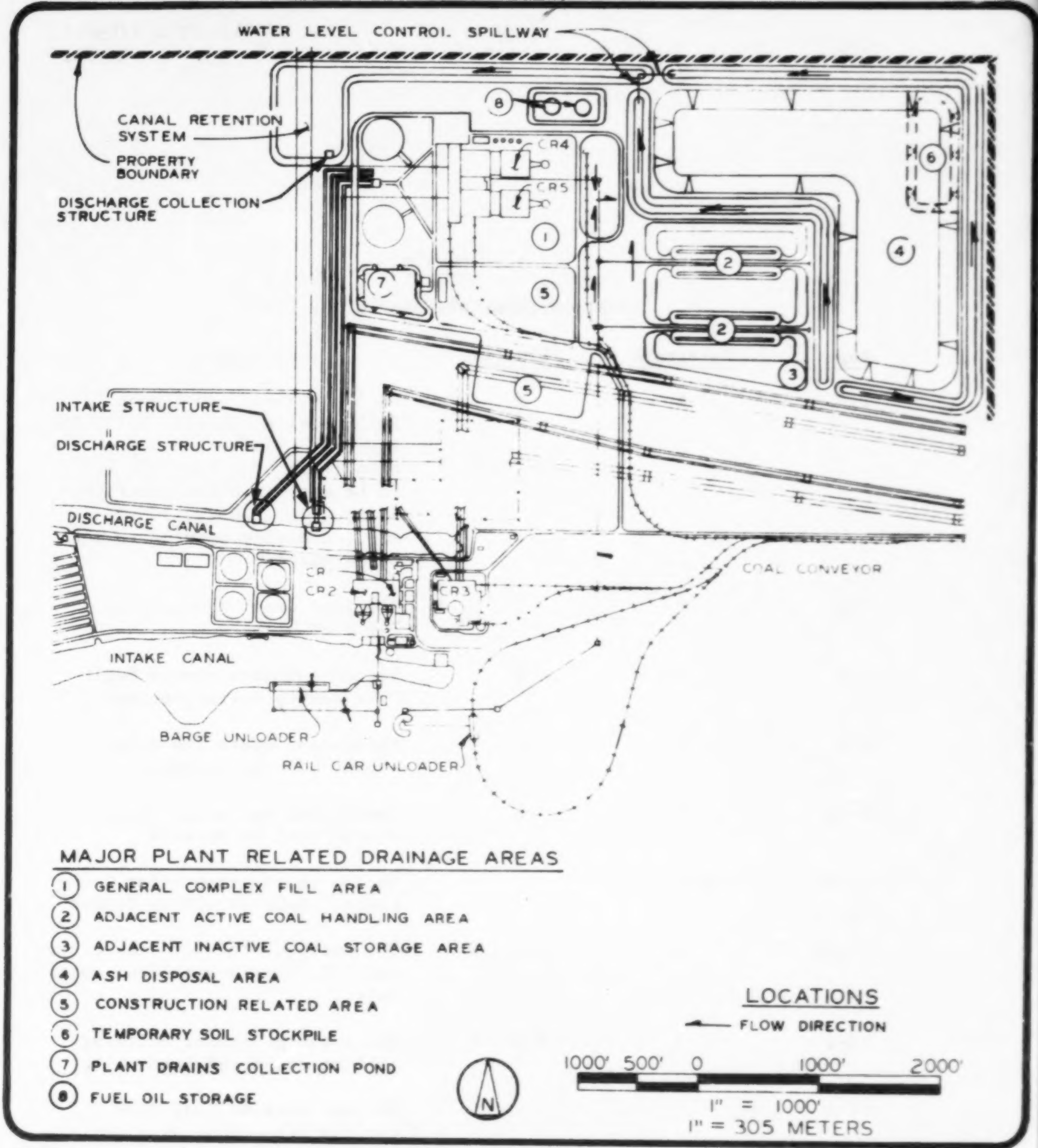

WATER LEVEL CONTROL SPILLWAY
CANAL RETENTION SYSTEM
PROPERTY BOUNDARY
DISCHARGE COLLECTION STRUCTURE
CR4
CR5
INTAKE STRUCTURE
DISCHARGE STRUCTURE
DISCHARGE CANAL
CR
CR2
CR3
COAL CONVEYOR
INTAKE CANAL
BARGE UNLOADER
RAIL CAR UNLOADER
MAJOR PLANT RELATED DRAINAGE AREAS
① GENERAL COMPLEX FILL AREA
② ADJACENT ACTIVE COAL HANDLING AREA
③ ADJACENT INACTIVE COAL STORAGE AREA
④ ASH DISPOSAL AREA
⑤ CONSTRUCTION RELATED AREA
⑥ TEMPORARY SOIL STOCKPILE
⑦ PLANT DRAINS COLLECTION POND
⑧ FUEL OIL STORAGE
N
LOCATIONS
← FLOW DIRECTION
1000' 500' 0 1000' 2000'
1" = 1000'
1" = 305 METERS

Figure 23R

UNITS 4 AND 5 SYSTEM LAYOUT

SOURCE: Black and Veatch, 1980

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

Page	Paragraph	Line(s)	Correction
V-17	Table 41a		Table 41a has been revised since publication of the Draft EIS. Please see revised Table 41a-R. Changes reflect October 14, 1980 revisions to effluent standards. Bars on margins denote changes.
V-22	2	5	"the containment dike" should be changed to "the dike."
V-25	3	1	"storage site" should be "storage silo."
V-25	4	6 and 7	The third sentence is revised to read "the storage area will be developed in 8-hectare (20-acre) segments.
V-26	Table 42		Column subheadings are revised to show 1,000 lb/day (10^3 lb/day).
V-31	2	6	In list of emission rate limitations, "Nitrogen Dioxide" is revised to "Nitrogen Oxides."
V-35	Table 45		Parentheses are added on pounds/hour under "Particulate Emissions."
VI-9	2	4	The parenthesis after "gallons" should be moved to follow "minute."
VII-5	2	All	The impacts discussed in this paragraph are construction impacts rather than plant operation impacts and should have been included in Chapter VI of the DEIS in the section called "Construction Impacts."
VII-7	5	2	This sentence is revised to read "Part III, Conditions, requires that all coal piles directly associated with Units 4 and 5 containing coal with a pyrific sulfur content greater than 0.2 percent be lined.
VII-9	2	3	The most recent Conditions of Certification were issued in May 1980. (See comment DER-1 in Chapter 4 of this FEIS.)

Table 41a-R. U.S. Environmental Protection Agency Standards of Performance for New Sources: Maximum Allowable Discharge Concentrations by Waste Source[1,2]

	Effluent Characteristics															
	Total Suspended Solids		Oil & Grease		pH	PCB[4]	Copper, Total		Iron, Total		Free Available Chlorine[5]		Zinc, Chromium, Phosphorus, and Other Corrosion Inhibitors		Heat
Waste Source	Daily Max.	Daily Ave.	Daily Max.	Daily Ave.	Allow. Range		Daily Max.	Daily Ave.	Daily Max.	Daily Ave.	Max. Instantaneous	Chlorination Period Ave.	Daily Max.	Daily Ave.	
1. All discharges					6.0-9.0	ND[6]									
2. Low volume wastes[7]*	100mg/1	30mg/1	20mg/1	15mg/1											
3. Bottom ash transport water[8]*	100mg/1	30mg/1	20mg/1	15mg/1											
4. Fly ash transport water[13]*	ND[6,9]	ND[6,9]	ND[6,9]	ND[6,9]											
5. Metal cleaning wastes and boiler blowdown[7]*	100mg/1	30mg/1	20mg/1	15mg/1			1 mg/1	1 mg/1	1 mg/1	1 mg/1					
6. Cooling tower blowdown[10]											0.5mg/1	0.2mg/1	NDA[6,14]	NDA[6,14]	
7. Main Condenser*															ND[6,9,11]
8. Coal Pile runoff[12]	50mg/1	50mg/1			6.0-9.0										
9. Construction runoff[12]*	50mg/1[9]	50mg/1[9]			6.0-9.0										

FOOTNOTES FOR TABLE 41a-R.

[1] The quantity of pollutants discharged from waste sources 1-6 shall not exceed the quantity determined by multiplying the flow from the waste source times the concentration in the table.

[2] In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

[3] Daily Maximum: Maximum 24-hour value: Daily Average: Average value for 30 consecutive days.

[4] PCB: Polychlorinated biphenyl compounds.

[5] Neither free available chlorine nor total residual clorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator that the units in a particular location cannot operate at or below this level of chlorination. Note: Instantaneous maximum concentration of total residual chlorine (total residual oxidants) of 0.14 mg/l included in October 14, 1980, proposal.

[6] NDA: No detectable amount and ND: No discharge.

[7] Include, but are not limited to wastewaters from wet scrubber air pollution control systems, ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, floor drainage, cooling tower basin cleaning wastes, and blowdown from recirculating house service water systems. Boiler blowdown is included in October 14, 1980, proposal.

[8] The quantity of pollutants discharged in bottom ash transport water shall not exceed the quantity determined by multiplying the flow of bottom ash transport water times the above concentrations and dividing the product by 20. Elimination of this requirement is included in the October 14, 1980, proposal.

[9] Limitations remanded and set aside by the United States Court of Appeals for the Fourth Circuit on July 16, 1976.

[10] Blowdown shall mean the minimum discharge of recirculating cooling water for the purpose of discharging materials contained in the process, the further buildup of which would cause concentrations or amounts exceeding limits established by best engineering practice.

[11] There shall be no discharge of heat from the main condensers except heat may be discharged in blowdown from recirculated cooling water systems provided the temperature at which the blowdown is discharged does not exceed at any time the lowest temperature of recirculated cooling water prior to the addition of the makeup water.

[12] Any untreated overflow from facilities, constructed and operated to treat the volume of material storage runoff and construction runoff which results from a 10-year, 24-hour rainfall event, shall not be subject to the pH and total suspended solids limitations stipulated for this waste source.

[13] Dry fly ash handling requirement included in October 14, 1980, proposal (i.e., no discharge of copper, nickel, zinc, arsenic, and selenium).

[14] No discharge of cooling tower maintenance chemicals which contain the 129 priority pollutants is included in the October 14, 1980, proposal.

FOOTNOTES FOR TABLE 41a-R (Continued, Page 2 of 2).

pH measured in standard units
mg/l--milligrams per liter
*These standards do not apply to the Crystal River Units 4 and 5 plant, as designed.

Sources: U.S. Environmental Protection Agency (EPA), "Steam Electric Power Generating Point Source Category: Effluent Guidelines and Standards," Federal Register, Volume 39, No. 196, October 8, 1974. 40 CFR Part 423 (Promulgated).
U.S. EPA, "Effluent Limitations Guidelines, Pretreatment Standards and New Source Performance Standards Under Clean Water Act; Steam Electric Power Generating Point Source Category," Federal Register, Volume 45, No. 200, October 14, 1980. 40 CFR Part 423 (Proposed).

Page	Paragraph	Line(s)	Correction
VII-11	Table 48		Table 48 should be switched with Table 50. Table 48 should be "Effluent Monitoring Program." In addition, the table is revised (see revision of Table 48, Table 48-R).
VII-15	Table 50		Table 50 should be switched with Table 48. Table 50 should be "Groundwater Quality Parameters" (see revision of Table 50, Table 50-R).

2.2 TECHNICAL SUPPORT DOCUMENT, VOLUME I

Page	Paragraph	Line	Correction
2-19	1	4	The references to Sections 2.5 and 2.7 should be to Section 2.7.2 only.
2-94	1	2	The term "wetland" used here and throughout the DEIS and TSD designates areas not necessarily covered by DER or COE regulations.
3-7	2	1	Insert "or sodded" after "seeded."
3-7	2	3	Insert "or sprigged" after "seeded."
3-27	Table 3.3-1		Stream numbers 15 through 22 were left out of this table. Please see Table 3.3-1R.
3-68	Figure 3.5-3		See revised Figure 3.5-3R. The catch basin drain for the truck apron is now shown as piped to an oil separator.
3-69	1	8	Oil-water separators are used only for runoff from areas that may be subject to oil spills, not for runoff from all areas.

Table 48-R. Effluent Monitoring Programs

Potential Discharge	Frequency of Monitoring				
	Continuous	Once Per Day	Once Per Week	Once Per Month	Other
Cooling Tower (NPDES 009 and 010)	Flow Temperature Conductivity Total residual oxidants(TRO)	pH	Cycles of concentration Phosphorus as P Calcium TRO		
Coal Storage Area Runoff (NPDES 011)			TSS	Heavy Metals,* As	Flow once per week during discharge overflow event
Ash Disposal Area Runoff (NPDES 012)			TSS	Heavy Metals,* As	Flow once per week during discharge overflow event
Runoff Collection System (NPDES 013)		pH	Oil and grease	Heavy Metals,* As	Flow once per day during discharge overflow event; TSS twice per week

*Includes cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, and zinc. Monitored once per month during discharge; otherwise, at end of the 3-month sampling period.

TSS = Total Suspended Solids

Source: Environmental Science and Engineering, Inc., 1980.
Environmental Protection Agency, August 28, 1980, Draft NPDES Permit.

Table 50-R. Groundwater Quality Parameters

Key Water Quality Indicators (Monthly)

- Specific Conductivity*
- Color
- Turbidity
- Chloride
- Sulfate
- Dissolved Organic Carbon
- Total Dissolved Solids
- Total Suspended Solids
- Iron
- Nickel
- Selenium
- Chromium
- Arsenic
- Beryllium
- Mercury
- Lead

Monitored During Aquifer Analysis

- pH
- Redox Potential
- Specific Conductivity*
- Dissolved Oxygen
- Temperature

Extended Water Quality Indicators (Quarterly)

The key indicators listed above plus:

- Aluminum
- Barium
- Calcium
- Magnesium
- Sodium
- Cobalt
- Gross Alpha†
- Vanadium
- Molybdenum

---

*Monitored in all wells during aquifer analysis; monthly water quality program monitors specific conductivity in only four wells.

†If Gross Alpha $\geq$ 15 pic/l, the following elements will be analyzed:

- Radium 226
- Uranium
- Thorium

Source: Environmental Science and Engineering, Inc., 1980.

Table 3.3-1R. Crystal River Units 4 and 5 Site and Plant Water Use

Stream Number	Description	Peak		Normal		Temporary Shutdown	
		dm^3/s	(gpm)	dm^3/s	(gpm)	dm^3/s	(gpm)
1	Raw Well Water Supply	34.2	(543)	24.0	(381)	4.8	(77)
2	Water Pretreatment System Makeup	29.3	(465)	20.8	(330)	4.8	(77)
3	Solids Contact Basin Sludge	0.2	(3)	0.1	(2)	0	(0)
4	Solids Contact Basin Effluent	29.1	(462)	20.7	(328)	4.8	(77)
5	Filter Backwash Wastewater	0.4	(6)	0.4	(6)	0	(0)
7	Gravity Filter Effluent	28.7	(456)	20.3	(322)	4.8	(77)
9	Ash Handling System Service Water Uses	0.3	(4)	0.3	(4)	0	(0)
10	Miscellaneous Station and Potable Water Uses	3.5	(56)	3.5	(56)	3.5	(56)
11	Demineralizer Makeup	24.9	(396)	16.5	(262)	1.3	(21)
12	Demineralizer Regeneration Wastes	1.0	(16)	0.7	(11)	0.7	(11)
13	Condensate-Feedwater-Steam Cycle Makeup	23.9	(380)	15.8	(251)	0.6	(10)
14	Steam Cycle Evaporative Losses						
15	Steam Cycle Liquid Losses	7.8	(123)	5.1	(81)	0	(0)
16	Condensate Polisher Wastes	0.7	(12)	0.6	(10)	0.6	(10)
17	Neutralization Basin Effluent	1.7	(28)	1.3	(21)	1.3	(21)
18	Cooling Towers Makeup (saltwater)*	4,289	(68,000)	4,289	(68,000)	0	(0)
19	Cooling Towers Evaporation	711.5	(11,280)	433.4	(6,870)	0	(0)
20	Cooling Towers Drift	0.8	(13)	0.5	(8)	0	(0)
21	Cooling Towers Blowdown	3,577	(56,707)	3,855	(61,122)†	0	(0)
22	Raw Well Water to Ash Handling Systems	4.9	(78)	3.2	(51)	0	(0)

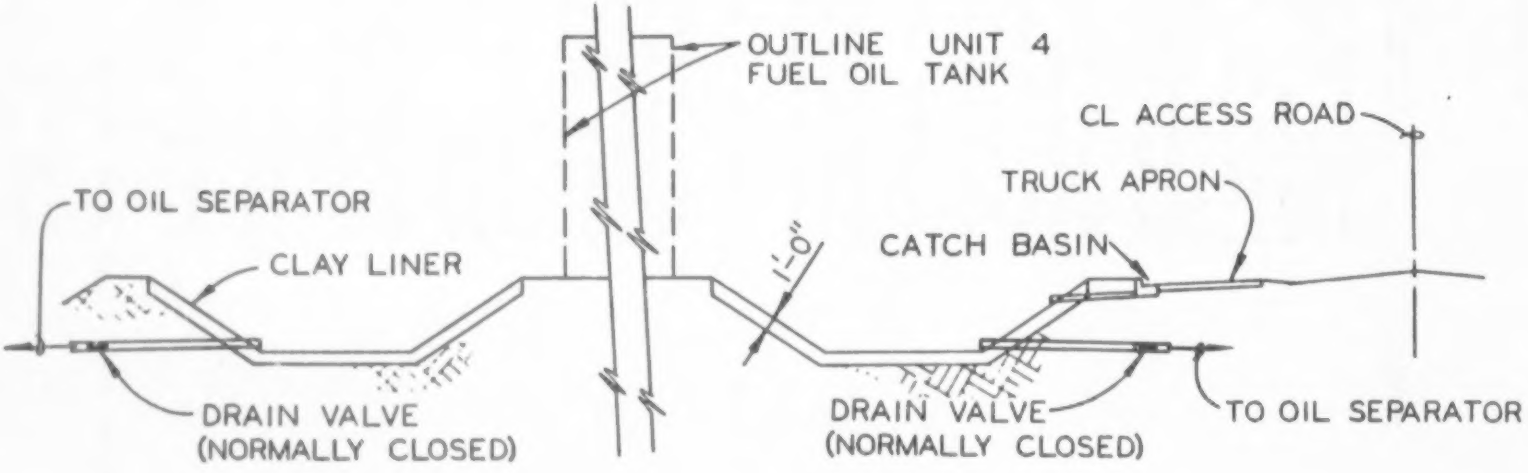

OUTLINE UNIT 4
FUEL OIL TANK
CL ACCESS ROAD
TRUCK APRON
TO OIL SEPARATOR
CATCH BASIN
CLAY LINER
1'-0"
DRAIN VALVE
(NORMALLY CLOSED)
DRAIN VALVE
(NORMALLY CLOSED)
TO OIL SEPARATOR

Figure 3.5-3R
FUEL OIL RECOVERY

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

Page	Paragraph	Line(s)	Correction
3-98	Figure 3.9-2		Administration Building is referenced on Page 3-96 as being shown in Figure 3.9-2. It is not shown in this figure, but is correctly shown in Figure 3.1-4. The same is true for the Maintenance Building referenced on Page 3-99.
4-1	2	6	No grouting will be used for any structures. Load-bearing fill will be added on top of the Inglis Formation or drilled piers will be used.
4-2	1	4	Change "200" to 1,570."
4-9	2	4	".064 millimeters to .76 millimeters" should be "6.4 millimeters to 76 millimeters."
5-28	2	3	"1,300" should be "1,200."
5-46	3	7	Sentence is revised to read "...unless the confined rainfall runoff exceeds the volume of runoff resulting from a 10-year, 24-hour storm."
5-52	1	1	The well monitoring program has been revised. See Chapter 3 of this FEIS.
5-78	1	9	"583" should be "363."
5-78	1	17	"198" should be "194."
5-79	Table 5.4-1		Table 5.4-1 is revised. See Table 5.4-1R.
5-82	Table 5.4-2		Table 5.4-2 is revised. See Table 5.4-2R.

2.3 TECHNICAL SUPPORT DOCUMENT, VOLUME II

Page	Paragraph	Line(s)	Correction
6-38	3	4	The reference to Figure 2.9-1 should be to Figure 2.8-1.

Table 5.4-1R. Summary of Significant Deterioration Analysis, Class II Areas, Florida Power Corporation, Crystal River Units 4 and 5, Citrus County, Florida

	Maximum Concentration (ug/m^3)				
	Sulfur Dioxide			Total Suspended Particulate*	
Scenario	Average	24-Hour	3-Hour	Average	24-Hour
Incremental impact Crystal River Units 4 and 5	3	44	363	<1	4
Maximum in Area					
1974 Baseline	5	46	583	30	
1984 with Units 4 and 5	6	109	777	36	
Maximum Increase Over Baseline at Worst Receptor	1	63	194	6	2
State of Florida AAQS's	60	260	1,300	60	150
Allowable Federal Increment	20	91	512	19	37

* Concentrations include a background level of 30 ug/m^3.

Source: Environmental Science and Engineering, Inc., 1977.

Table 5.4-2R. Summary of Significant Deterioration Analysis, Class I Areas--Chassahowitzka National Wilderness Area, Florida Power Corporation, Crystal River Units 4 and 5, Citrus County, Florida

Scenario	Maximum Concentration (ug/m^3)				
	Sulfur Dioxide			Total Suspended Particulate*	
	Annual Average	24-Hour	3-Hour	Annual Average	24-Hour
Crystal River Units 4 and 5 Incremental Impact	<<1	12	51	<<1	1
Maximum in Class I Area					
1974 Baseline	1	30	95	30	32
1984 with Units 4 and 5	1	31	120	30	32
Increase Since Baseline	<<1	<1	25	<<1	1
Allowable Federal Increment	2	5	25	5	10

* Background TSP concentration of 30 ug/m^3 added to modeling results.

Source: Environmental Science and Engineering, Inc., 1977.

Page	Paragraph	Line	Correction
6-39	1		The water quality monitoring program also includes the makeup water intake, Serial Number 014.
7-22	4	2 and 4	The total operating workforce is 132 (DEIS, Page ix, mentions workforce of 162).
8-29	2	1	"250 mmBtu/hr" should be "250 million Btu/hr."
9-1			The following paragraph is added: NOTE: The information contained in this chapter reflects the preliminary engineering design criteria data available when alternatives were evaluated. Design information contained in Chapter 3 of the TSD is the most current data available for the proposed units.

3.0 SUPPLEMENTAL ANALYSES AND MONITORING PROGRAMS

Under the State of Florida Conditions of Certification and the Draft NPDES permit conditions, Florida Power is required to perform two major studies. These are:

1. Groundwater monitoring program.
2. Study of salt deposition from natural draft cooling towers, Crystal River Units 4 and 5.

Draft Plans of Study for these programs are presented in this chapter. Approval of these programs is required by the Draft NPDES permit conditions and by the State Conditions of Certification.

Florida Power has elected to install and operate dechlorination facilities. As a result, dye studies discussed in the DEIS intended to determine the dilution of chlorine discharges will not be necessary.

Effluent monitoring for surface water discharges required by the first draft (October 28, 1980) of the NPDES permit has remained the same except for monitoring of total residual chlorine (better termed total residual oxidants). Along with continuous monitoring of total residual oxidants (TRO), manual monitoring for TRO and auditing of the continuous monitor will be required once per week.

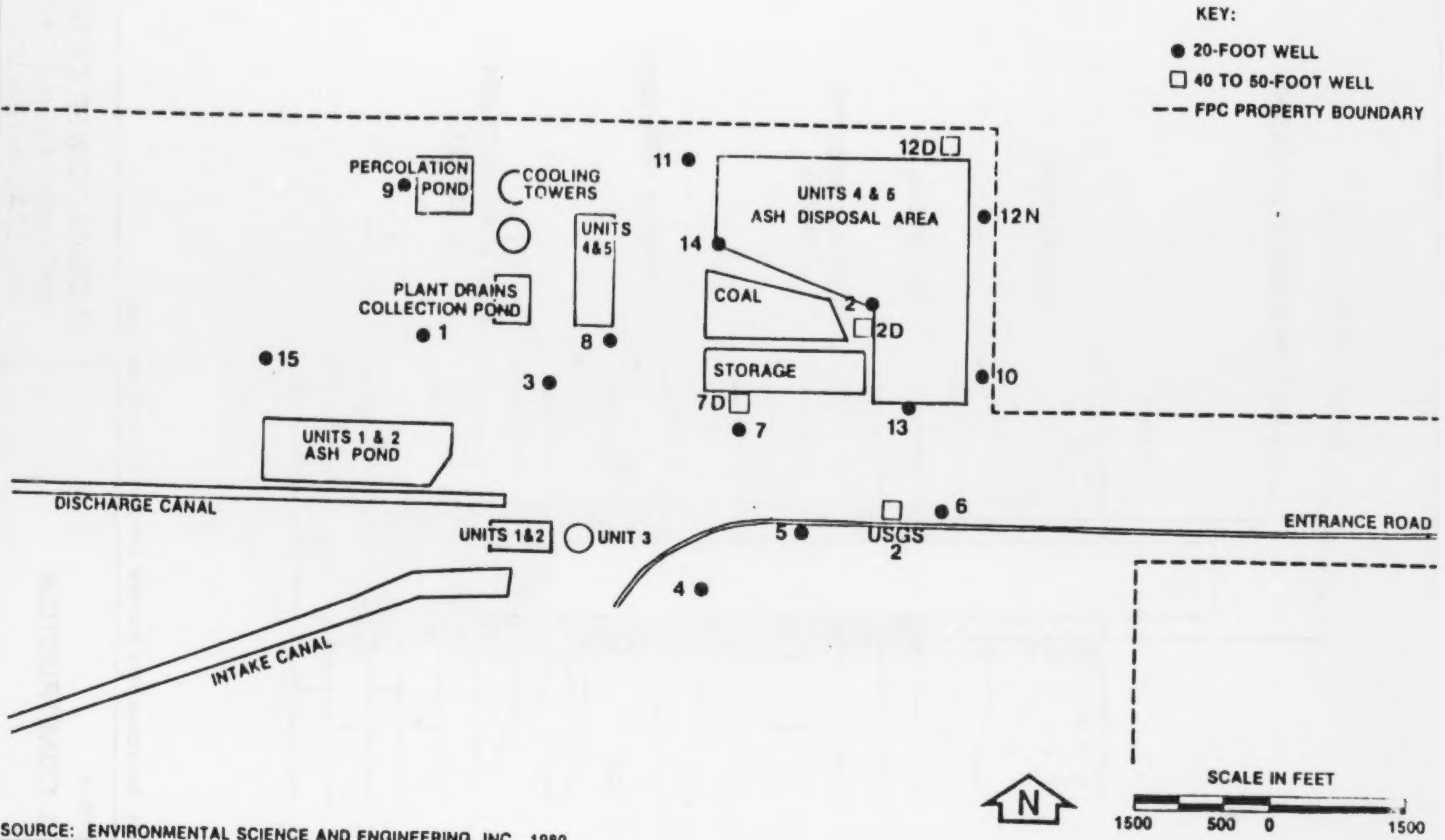
GROUNDWATER MONITORING PROGRAM

A groundwater monitoring program will be implemented to detect significant groundwater contamination.

The monitoring system will consist of the wells depicted in Figure 1. Details of well construction consistent with specifications in the Draft Environmental Impact Statement are shown in Figure 2. A list of the wells with their diameters and depths is presented in Table 1.

Each well will be sampled monthly according to the following procedure: An equivalent of three times the volume of water in each well will be evacuated from each well to obtain representative water quality samples. The well will then be allowed to recover. The samples will be drawn from the wells using an all-plastic hand pump to minimize contamination from any metal components of a centrifugal pump. Water will be pumped through the hand pump for approximately 30 strokes to prevent cross contamination from previous wells. The sample bottles will then be filled, preserved and placed on ice for shipping. All samples will be delivered to an analytical laboratory for analyses within 24 hours.

The samples will be analyzed for those parameters addressed in Florida Department of Environmental Regulation (DER) Class IB groundwater criteria: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. The analyses will be conducted according to Environmental Protection Agency (EPA) Method 600/4-79-020. Results will be reported quarterly.

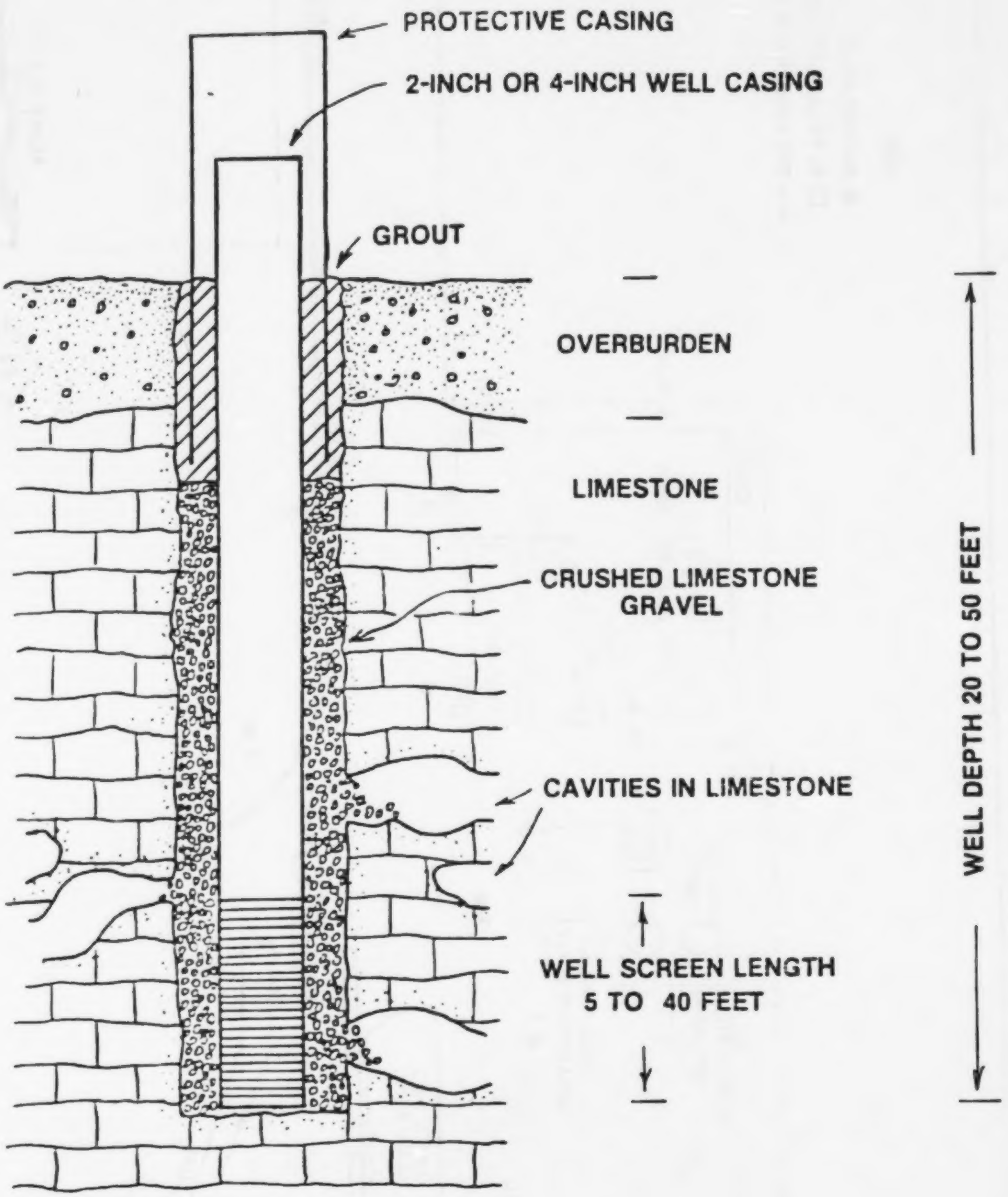


KEY:
● 20-FOOT WELL
□ 40 TO 50-FOOT WELL
— — FPC PROPERTY BOUNDARY
PERCOLATION POND
9
COOLING TOWERS
UNITS 4&5
PLANT DRAINS COLLECTION POND
1
15
8
3
11
14
UNITS 4 & 5 ASH DISPOSAL AREA
12D
12N
COAL
2
2D
STORAGE
10
7D
7
13
UNITS 1 & 2 ASH POND
DISCHARGE CANAL
UNITS 1&2
UNIT 3
5
USGS 2
6
4
ENTRANCE ROAD
INTAKE CANAL
N
SCALE IN FEET
1500
500
0
1500

SOURCE: ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1980

Figure 1
WELL LOCATIONS

FLORIDA POWER CORPORATION
GROUNDWATER MONITORING
CRYSTAL RIVER UNITS 4 & 5


PROTECTIVE CASING
2-INCH OR 4-INCH WELL CASING
GROUT
OVERBURDEN
LIMESTONE
CRUSHED LIMESTONE GRAVEL
CAVITIES IN LIMESTONE
WELL SCREEN LENGTH 5 TO 40 FEET
WELL DEPTH 20 TO 50 FEET

SOURCE: ENVIRONMENTAL SCIENCE AND ENGINEERING, INC., 1980

Figure 2
WELL CONSTRUCTION

FLORIDA POWER CORPORATION
GROUNDWATER MONITORING
CRYSTAL RIVER UNITS 4 & 5

Table 1. List of Wells--FPC Crystal River

Well Number	Well Diameter (inches)	Well Depth (feet)	Casing (feet)
1	2	20	18.5
2	4	20	18.5
2D	2	58	53.8
3	4	20	18.5
4	2	23	23
5	2	20	18.5
6	2	20	18.5
7	4	20	18.5
7D	4/2*	45	42.4
8	2	20	18.5
9	2	20	18.5
10	2	20	18.5
11	2	20	18.5
12	4	20	18.5
12D	2	53	47.3
13	2	20	18.5
14	2	20	18.5
15	4	20	18.5

*Upper 17.4 feet of hole has 4-inch casing: 2-inch casing from 17.4 feet to bottom of hole.

Source: Environmental Science and Engineering, Inc., 1980.

Plan of Study
for
Salt Deposition from
Natural Draft Cooling Towers
Crystal River Units 4 and 5

Submitted by

Environmental and Licensing Affairs Department
Florida Power Corporation

August, 1980

REV.1-12/2/80

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1.0 Introduction

Florida Power Corporation (FPC) requires new generation in order to provide electrical power in its service area. This need is to be met by the construction of two new 695 gross megawatt coal-fired steam electric units at Crystal River, Florida. These two new units, Crystal River Units 4 and 5, will utilize saltwater off-stream cooling with natural draft cooling towers. 1

1.1 Objectives

The objectives of the program are:

1. To characterize the physical and chemical properties of vegetation surrounding the cooling tower for the purpose of obtaining a baseline for future comparison.
2. To monitor salt deposition levels emitted from Crystal River Units 4 and 5 cooling towers.
3. To study the effects of fallout on the surrounding vegetation.
4. To study the effects of fallout on the surrounding FPC equipment.

1.2 Regulatory Requirements

1.2.1 State of Florida Regulations

Pursuant to Chapter 403, S.403.506, Florida Statutes, and Chapter 17-7, Florida Administrative Code, all electrical power plants constructed after October 1, 1973, must obtain state regulatory certification.

Florida Department of Environmental Regulation (FDER) issued a site certification for Crystal River Units 4 and 5, case number PA 77-09, on November 21, 1978. Within this certification, special conditions were assigned as part of the approval. The condition associated with this program is listed below:

"Special Condition
1. Air
B. Air Monitoring Program
   7. Salt drift deposition, accumulation, vegetative effects and effects on equipment shall be monitored and reported to the department in a manner and frequency approved by the department prior to the operation of the first cooling tower."

1.2.2 United States Environmental Protection Agency

Condition III.M of the United States Environmental Protection Agency's (USEPA) NPDES draft permit contained in Appendix A of the Draft Environmental Impact Statement requires submittal of this program prior to issuance of the Final Environmental Impact Statement. 1

2.0 Study Area

The property owned by FPC consists of 1,917 hectares (4,738 acres) located in Range 16 East, Township 17 South, and includes portions of Sections 28 through 37. The location of the units lies within the southern one half of Section 28 and southeast one quarter of Section 29, Range 16 East, Township 17 South. This location does not include the access road. Approximately 129 hectares (319 acres) are presently occupied by Crystal River Units 1, 2, and 3 and support facilities. The use of an additional 136 hectares (335 acres) of the property is proposed for the construction of Crystal River Units 4 and 5, support facilities, and another access road. With the exception of the access road to the existing units, the remaining area is undeveloped.

Figure 2-1 shows the proposed site on a topographical map of the area. Figure 2-2 shows the site layout for all facilities at Crystal River.

Crystal River Units 4 and 5 generating plants will each have a natural draft cooling tower. Each tower will be approximately 110 meters (370 feet) in diameter and 134 meters (440 feet) high. Each is designed to reject to the atmosphere the total heat load for each unit at full load operating conditions. The following design conditions have been selected:

Cooling Range	14.2°C (24.6°F)
Approach	6.7°C (12°F)
Wet Bulb	26.1°C (79°F)

Cooling tower make-up will be at a constant rate regardless of generating unit load. The cycles of concentration of the circulating water will, therefore, vary, depending on the operating load of the units. The make-up water will be taken from the Crystal River Units 1, 2, and 3 discharge canal.

2.1 Research Site Layout

Each plot of land selected for collecting data will have a similar layout, and will include vegetation and dust fall sampling locations. The size of each site will be approximately 0.0929 hectares (0.2296 acres, 100 feet square).

Figure 2-3 shows a typical research site layout. 1

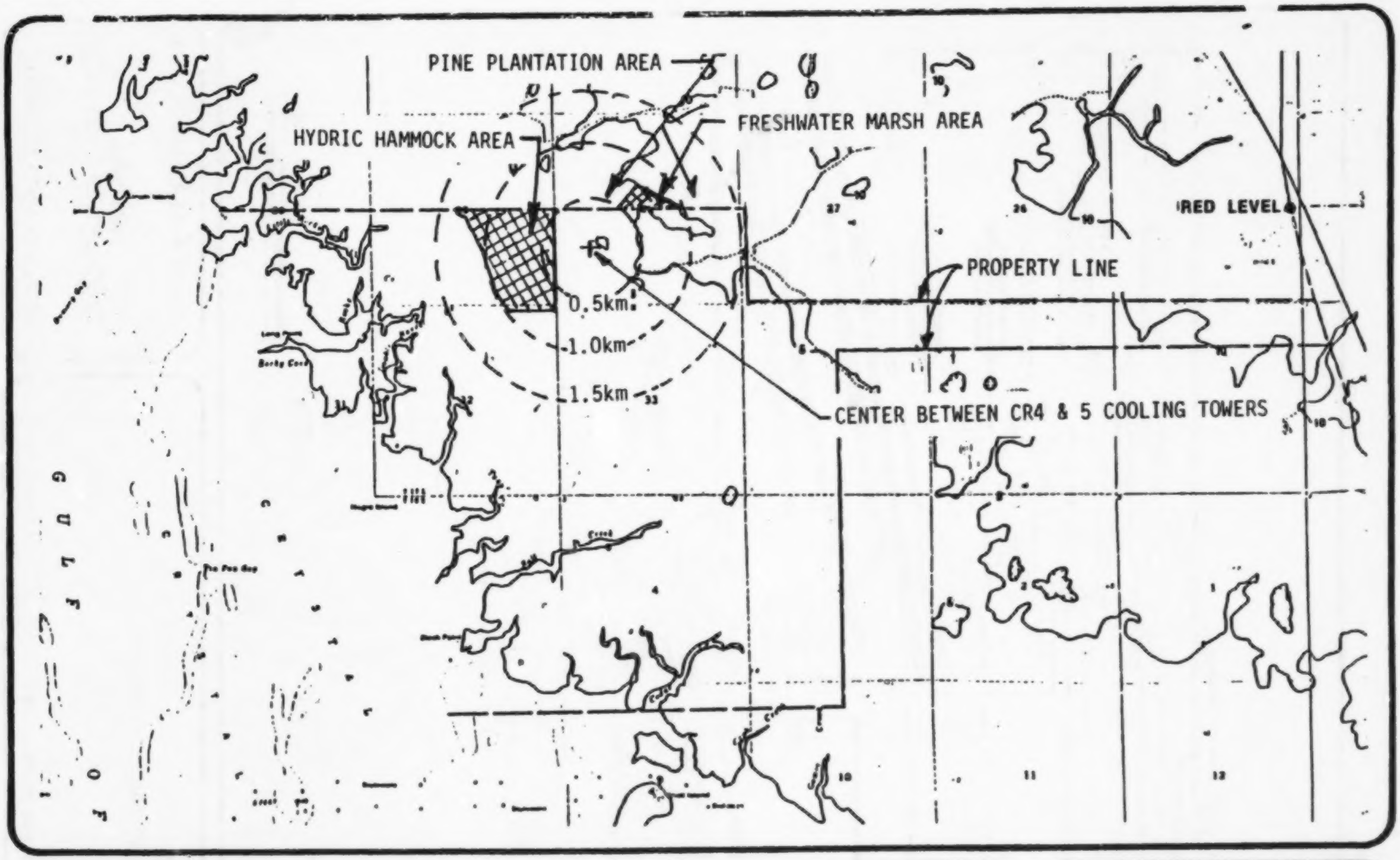

PINE PLANTATION AREA
FRESHWATER MARSH AREA
HYDRIC HAMMOCK AREA
RED LEVEL
PROPERTY LINE
0.5km
1.0km
1.5km
CENTER BETWEEN CR4 & 5 COOLING TOWERS
G U L F
O F

Figure 2-1
TOPOGRAPHIC MAP OF FLORIDA POWER CORPORATION, CRYSTAL RIVER PROPERTY FOR PROPOSED SITE

WITH SALT DRIFT SAMPLING
AREAS WITHIN ONE KILOMETER

SOURCE: FROM USGS SURVEY RED LEVEL, FLORIDA 1954

N
0 1000 2000 3000 4000 5000
SCALE IN FEET

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

REV.1-12/2/80

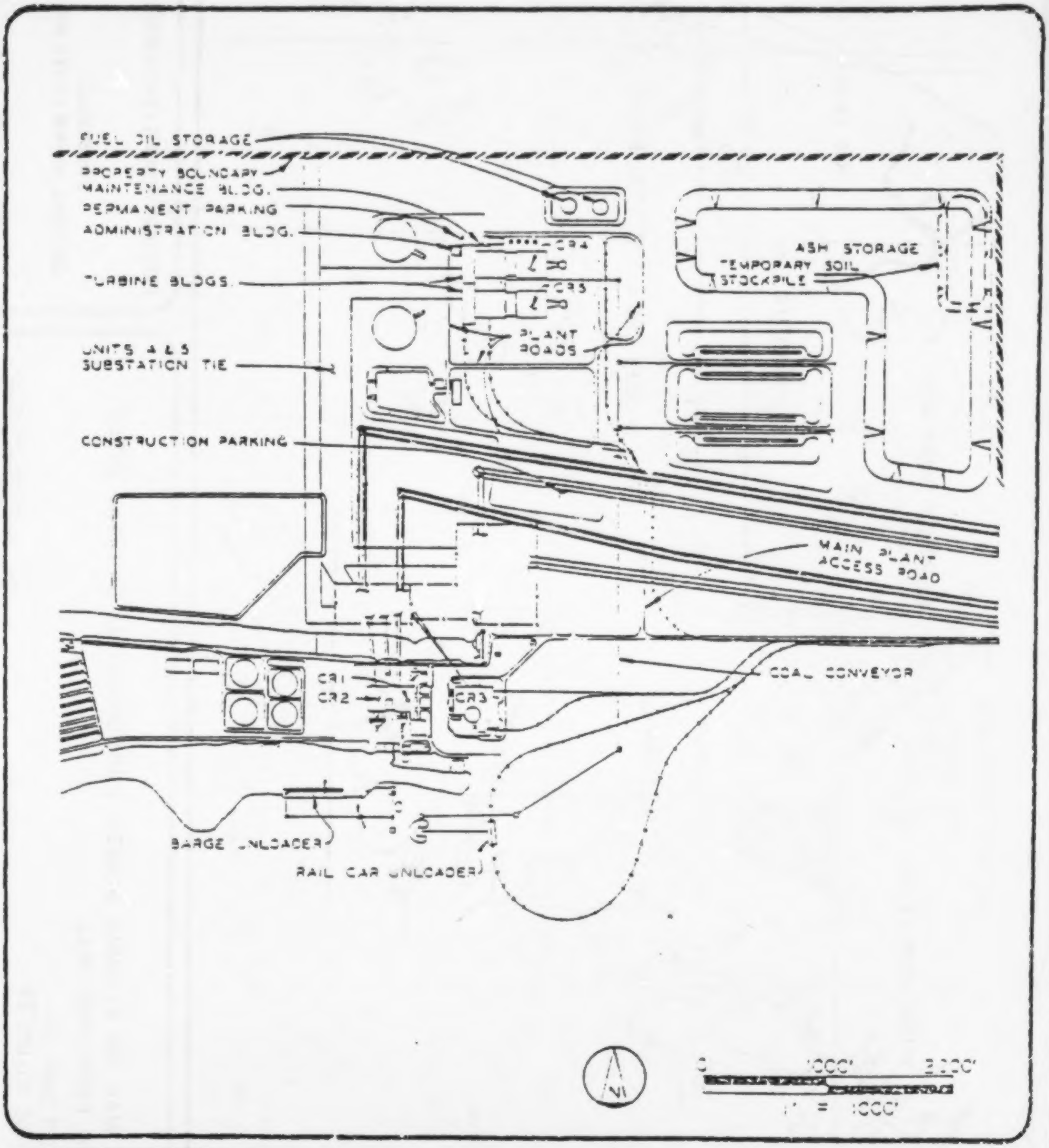

FUEL OIL STORAGE
PROPERTY BOUNDARY
MAINTENANCE BLDG.
PERMANENT PARKING
ADMINISTRATION BLDG.
CR4
TURBINE BLDGS.
CR5
ASH STORAGE
TEMPORARY SOIL STOCKPILE
PLANT ROADS
UNITS 4 & 5 SUBSTATION TIE
CONSTRUCTION PARKING
MAIN PLANT ACCESS ROAD
COAL CONVEYOR
CR1
CR2
CR3
BARGE UNLOADER
RAIL CAR UNLOADER
N
0
1000'
2000'
1" = 1000'

Figure 2-2
CRYSTAL RIVER FACILITY LAYOUT

SOURCE: BLACK AND VEATCH, 1976.

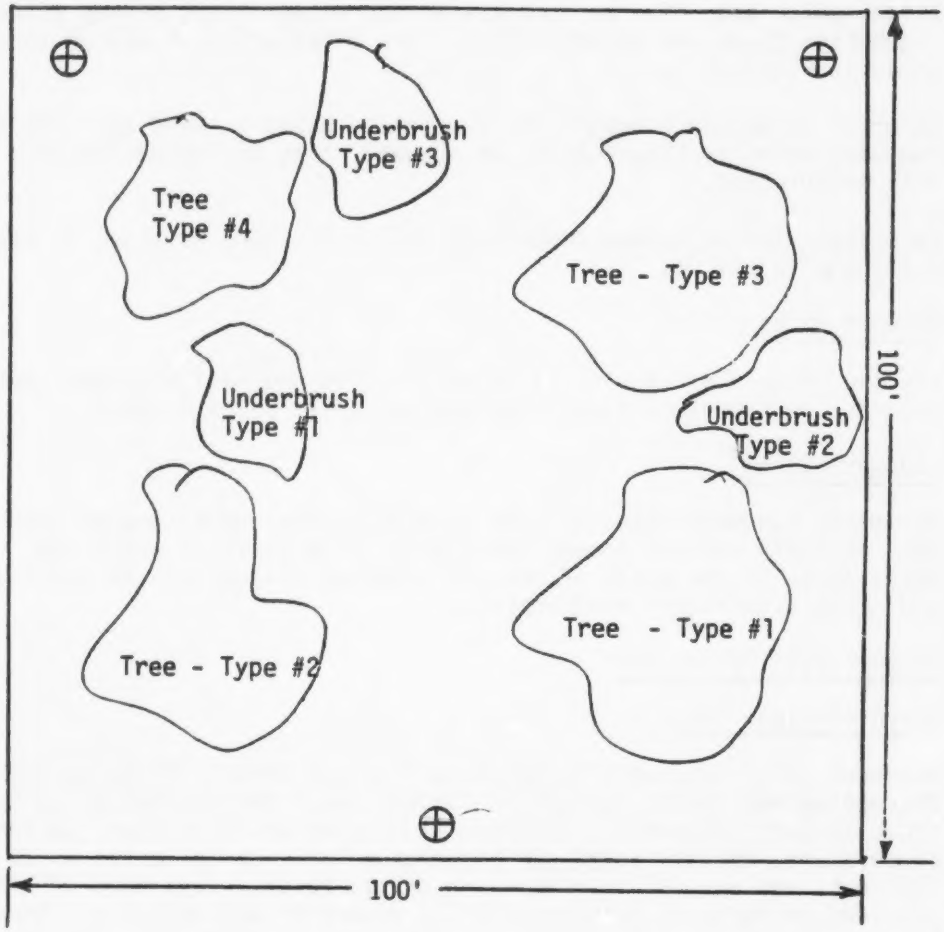
FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

Figure 2 - 3 Typical Research Site Layout - Salt Drift Study

Plot Size = 100' x 100'
= 0.2296 Acres
= 0.0929 hectare


Underbrush Type #3
Tree Type #4
Tree - Type #3
Underbrush Type #1
Underbrush Type #2
Tree - Type #2
Tree - Type #1
100'
100'

⊕ Dust fall collector

1

3.0 METHODOLOGY

A systematic approach is being used to determine research sites.

3.1 Research Site Selection

There are three areas of major concern regarding impact to vegetation communities: freshwater marsh, hydric hammock, and pine plantation. During our site certification evaluation, on-site vegetation species lists were compiled. Potential species for study are shown in Table 3-1.

The selection of research sites will be performed by careful analysis of aerial color and infrared photographs and actual field survey to confirm vegetation types and accessibility. The sites will lie within the areas shown in Figure 2-1. 1

In order to obtain adequate representation based on wind patterns shown in the wind roses in Figure 3-1, two seaward sites and three landward sites will be selected.

Each site will also have three dust fall collectors as shown in Figure 2-3, Typical Site Layout. 1

3.1.1 Seaward Sites

The two seaward sites will be located within one half kilometer west of the natural draft cooling towers for Crystal River Units 4 and 5.

3.1.2 Landward Sites

The three landward sites will be located within one kilometer east of the natural draft cooling towers for Crystal River Units 4 and 5 and, preferably, in the areas of concern occuring closest to the cooling towers and along significant wind vectors. 1

3.2 Support Data Collection

3.2.1 Meteorological Data

Meteorological data will be obtained from the Crystal River Unit 3 Meteorological System located in the northeast one quarter of section 32, Range 16 East, Township 17 South. Wind speed and direction, ambient air temperature, and dew point air temperature will be collected at 10 meters (33 feet) and rainfall collected at ground level. This data will be provided on magnetic tape for further reduction and analysis. Annual wind Roses are shown in Figure 3-1. 1

3.2.2 Substation Maintenance

Maintenance performed during the study year on the existing 230 KV and 500 KV substation equipment will be evaluated to determine if any damage and/or operational problems are directly associated to salt loading.

3.3 Sampling Techniques

Selected sampling techniques to measure salt drift and any resultant effects to the vegetation consist of sampling leaves of selected species, observing plants for damage, quantifying salt deposition rates, and using aerial photography.

3.3.1 Vegetation

3.3.1.1 Field Procedures

The concentration of sodium and chloride ions in plant tissues will be monitored at each of the five sites being studied. Samples will consist of 10 to 15 grams (dry weight) of leaves or needles taken from each of three similar-aged plants of each of three to six species-age groups, at least one of which will be herbaceous. A listing of potential species to be sampled is provided in Table 3-1. Juvenile trees should be sought out for sampling, and in all cases samples should be taken from areas of the experimental plant that would be exposed to salt drift. All plants should be marked and tagged for a permanent record. Sampling should be conducted monthly for one year before operation and for one year after operation.

Monthly samples should be completed in a two to three day period. Sampling should never be attempted on rainy days or immediately thereafter, but rather one or two days later. Sampling is to be done with the collector wearing plastic surgical gloves to minimize the risk of contamination from perspiring hands. Samples are to be collected in labeled, brown paper bags. 1/

At the time leaf samples are taken, the sampling site will be surveyed for dead and injured vegetation. Especially noted will be curling, browning or splotching of leaves, particularly if other individuals of the same species in the surrounding area are similarly affected. Photographs will be taken of each site each month. 1

3.3.1.2 Laboratory Procedures

The leaves will be washed quickly in distilled water which will be analyzed for ion salts that were on the leaf. The leaves will then be dried in a forced-draft oven for 48 hours at 95°C. Upon drying, samples should be individually ground in a Wiley Mill, passed through a 20-mesh screen, and placed into screw-cap bottles for storage until analysis. 1

1/ Lauver, T. L., et al., 1978. Effects of Saline Cooling Tower Drift on Seasonal Variations of Sodium and Chloride concentrations in native perennial vegetation. In: Cooling Tower Environment - 1978. Water Resources Research Center Special Report No. 9. University of Maryland, College Park. I-49-I-63.

Chloride ion concentration in leaf tissues is to be determined by a method equivalent to the modified potentiometric titration method outlined by LaCroix, et al., (1970). 2/ In this methodology, an orion chloride ion electrode and double junction reference electrode is used in combination with an Orion model 701 digital pH meter. A 0.5 gram leaf sample is shaken in 50 mililiters of 0.1N HNO_3 on a wrist action shaker for 15 minutes. The solution is then titrated, while stirring, with 0.01 N $AgNO_3$:0.1 N HNO_3. The end point is determined as the millivolt reading of an aliquot of the 0.1 N HNO_3 used for chloride extraction. Standard procedures for this analysis require the preparation and analysis of three replicates for each sample. Chloride standards are titrated at the beginning of each run and a standard curve determined through regression analysis.

Sodium ion concentration in leaf tissues will be determined by atomic absorption spectrophotometry as described herein, or by an equivalent technique. In the suggested technique, a 0.5 gram leaf sample is weighed into a 15 mililiters crucible and heated in a muffle furnace at 475°C for a minimum of 12 hours. The resultant ash is dissolved in five mililiters of 20% (weight/volume) HCl and then gently heated (not boiled) to insure dissolution of the ashed sample. The mixture is washed through Whatman number 40 ashless filter paper and the filtrate diluted to 100 mililiters with distilled water. Three blanks are routinely run with every 24 replicates. A Perkin-Elmer model 303 atomic absorption spectrophotometer and sodium lamp is set up according to standard conditions for sodium. A standard curve is generated through regression analysis. Standard procedures require the analysis of three replicates for each sample. 3/

3.3.2 Dust Fall Collector

3.3.2.1 Field Collection Procedures

During the collection of vegetation samples, the three dust fall collectors will be serviced. Each contains two liters of demineralized distilled water. The removed unit will be capped and returned to the laboratory for analysis.

3.3.2.2 Laboratory Procedures

Each container of liquid collected from a dust fall collector will be analyzed as follows:

2/ LaCroix, R. L., D. R. Kenney, and L. M. Walsh, 1970. Potentiometric titration of chloride in plant tissue extracts using the chloride ion electrode. Soil Sci. Plant Anal. 1: 1-6.

3/ Mulchi, C.L., D.C. Wolf, and J.A. Armbruster, 1978. Cooling Tower Effects on Crops and Soils. University of Maryland Water Resources Research Center Special Report No. 11.

1. Insoluble material is removed by vacuum filtration through a Whatman number 41 filter paper after pre-weighing. After filtration has been complete, the filter containing insoluble material is dried in a forced-air oven at 70°C (158°F) overnight. Upon removal from the oven, the filter paper is placed in a desiccator for cooling to room temperature (same temperature at which filter paper was pre-weighed). Then final weight is obtained. The difference in weights represents the insoluble material fraction and is expressed as grams per square meter (g/m^2).

2. After filtration, a one liter sample of solute is kept for analysis of sodium ion (Na^+) and chloride ion (Cl^-). Sodium and chloride analysis is performed by standard analyzer procedures. Deposition of sodium and chloride is expressed as miligrams per square meter-month (mg/m^2 month). 4/

3.3.3 Aerial Survey

An aerial survey will be performed on a seasonal basis--fall, winter, spring and summer. Color infrared photographs will be taken. Care will be taken to insure that all aerial photographs taken in one year are taken from the same film dye batch.

The center of the photograph will be the midpoint between Crystal River Unit 4's cooling tower and Crystal River Unit 5's cooling tower on the north-south centerline and will cover an area of at least a two mile radius at a scale of 1"=2240 feet.

3.4 Equipment

The dust fall collector will be similar to Model 170, Research Appliance Company, Gibsonia, Pennsylvania 15004. Each unit will include a stand, dust fall jar, and bird ring. The bird ring is used to reduce contamination of samples by birds roosting on the edge of the jar. Each dust fall collector will be field-assembled as shown in Figure 3-2.

3.5 Analysis and Assessments

3.5.1 Plant Tissues

Results of chloride and sodium analyses are to be reported in micrograms per gram leaf dry weight. The term "ion load" adequately describes both internal and external foliar salt concentrations under natural conditions. Means, standard deviations, coefficients of variation, and standard errors of the mean are to be routinely determined for the three replicates of each

---

4/ Mulchi, C. L., D. C. Wolf, and J. A. Armbruster, 1978. Cooling Tower Effects on Crops and Soils. University of Maryland Water Resources Research Center Special Report Number 11.

leaf sample. Multi-year comparisons of data are to be made on the computer. Monthly trends, site comparisons, and year comparisons are to be made by an analysis of variance (Manova) program. Further definition of significant differences between means require Student-Newman-Keuls (SNK) test (P=.05) of significance or a similar test. 5/

3.5.2 Dust Fall Collector

Data obtained by analysis of dustfall collector for particulate, sodium ion (Na^+), and chloride ion (Cl^-) will be compiled; and monthly highs, lows, means, standard deviation, and coefficient of variation will be computed. Average monthly values obtained from all replicate samples will be shown in tabular and graphic form.

Both pre- and post-operational data will be treated in the same way and compared to determine impact.

3.5.3 Dust Fall vs. Vegetation Data

Data collected from dust fall collector will be compared to data collected from vegetation species.

Overall salt loading (sodium and chloride ions) wil be compared.

3.5.4 Aerial Survey

The seasonal aerial infrared photographs will be compared by pre- and post-operational conditions.

Salt drift effects, if any, shall be noted and reported.

5/ Sokal, R. R. and R. J. Rohlf, 1969. Biometry. Freeman, San Francisco.

Table 3-1 Potential Study Species
Ref: Crystal River Units 4 and 5 Site Certification Application, Volume 1, revised edition.

I. Freshwater Marsh Species

Type	Scientific Name	Common Name
Woody	*Acer rubrum**	(Red maple)
	Nyssa biflora	(Black gum)
	Pinus elliotti	(Slash pine)
Herbaceous	*Cladium jamaicense**	(Sawgrass)
	Juncus repens	(Creeping rush)
	Rhynchospora sp.	(Beak rush)
	*Juncus effusus**	(Soft rush)
	Saururus cernuus	(Lizards tail)

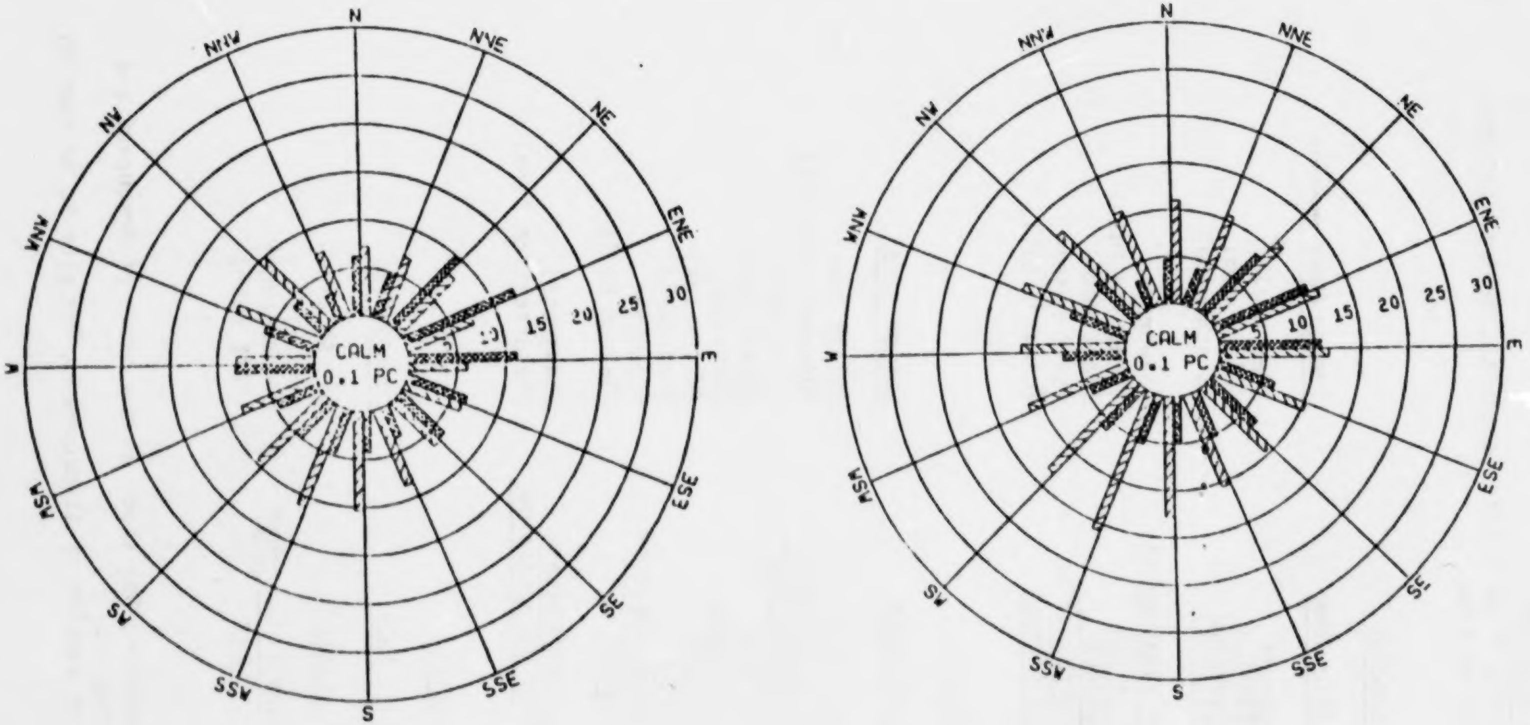
II. Hydric Hammock Species

Type	Scientific Name	Common Name
Woody	*Pinus elliotti*	(Slash pine)
	Quercus laurifolia	(Diamond leaf oak)
	*Quercus virginiana**	(Live oak)
	Nyssa biflora	(Black gum)
	Tilia americana	(Basswood)
	Quercus nigra	(Water oak)
	Acer rubrum	(Red maple)
	*Zamia integrifolia***	(Coontie)
	*Ilex cassine**	(Dahoon holly)
Herbaceous	*Cladium jamaicense**	(Sawgrass)
	Polypodium polypodioides	(Resurrection fern)

III. Pine Plantation Species

Type	Scientific Name	Common Name
Woody	*Pinus elliotti**	(Slash pine)
Herbaceous	*Andropogan virginicus**	(Broomsedge)
	Juncus effusus	(Soft rush)

* These species are suggested for study on the basis of frequency and distribution in the region.
**Coontie will always be sampled if it occurs on the site to be sampled.



33 ft

(JANUARY 1, 1975 – DECEMBER 31, 1975)

175 ft

(JANUARY 1, 1975 – DECEMBER 31, 1975)

▨ WIND DIRECTION FREQUENCY (PERCENT)

▨ MEAN WIND SPEED (MI/HR)

CRYSTAL RIVER ANNUAL WIND ROSES WITH
ASSOCIATED AVERAGE WIND SPEEDS FOR
THE 33- AND 175-FOOT LEVELS

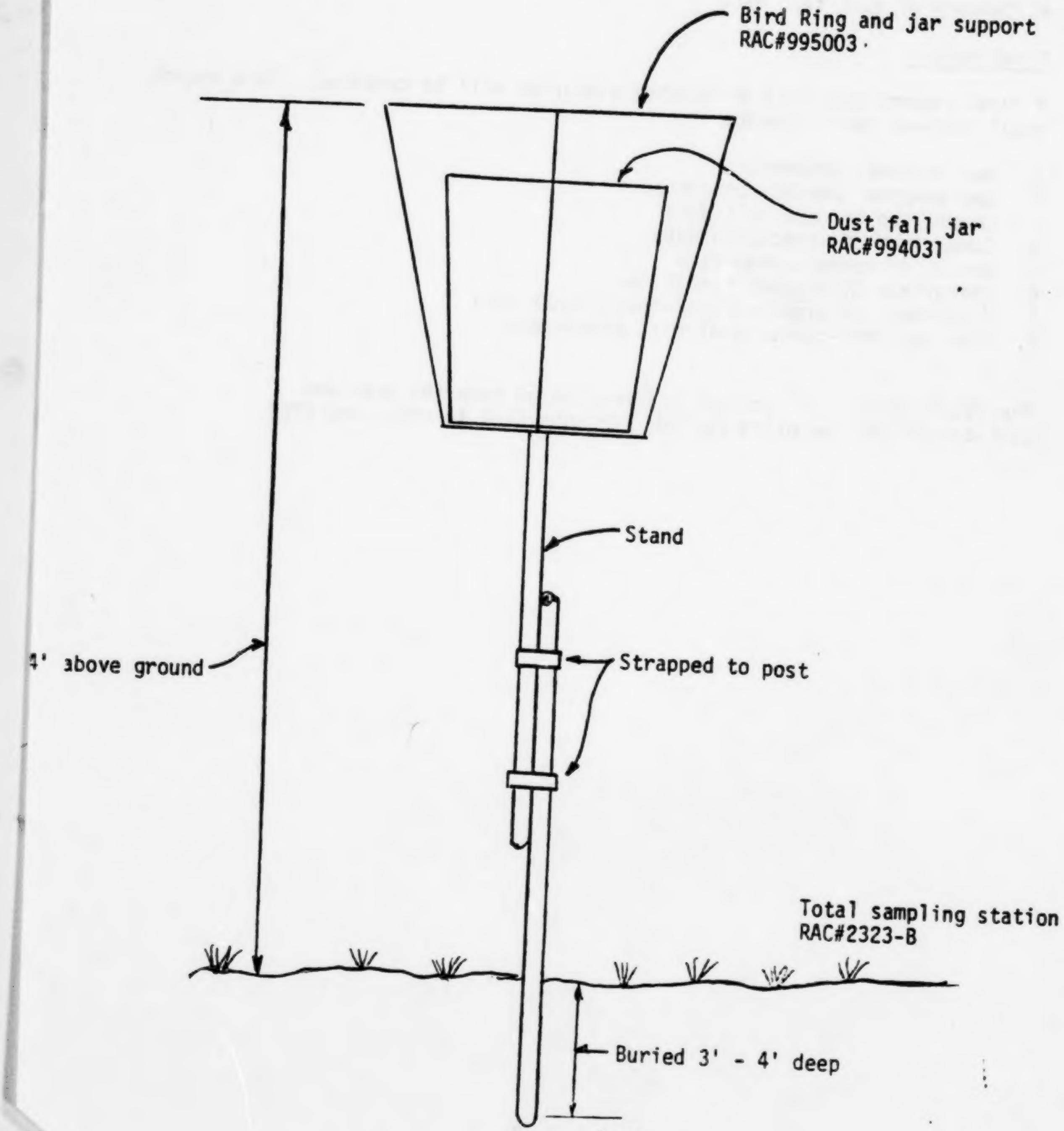
ANNUAL WIND ROSES

CRYSTAL RIVER 3

FIGURE 3 - 1

Florida Power

Figure 3 - 2 Dust Fall Collector Station Arrangement



Bird Ring and jar support
RAC#995003
Dust fall jar
RAC#994031
Stand
4' above ground
Strapped to post
Total sampling station
RAC#2323-B
Buried 3' - 4' deep

4.0 Reports

On a monthly basis, monthly summaries will be prepared for inclusion in the final report.

Included in this report will be:
1. Any abnormal occurance
2. Any abnormal weather condition
3. Summary of vegetation data
4. Summary of dust fall data

4.1 Final Report

A final report comprised of monthly summaries will be compiled. This report shall include the following:

1. Any abnormal occurance
2. Any abnormal weather condition
3. Comparison of dust fall data
4. Comparison of vegetation data
5. Aerial infrared survey data
6. Comparison of weather conditions
7. Assessment of pre- and post-operational data
8. Pre- and post-operational data comparison

The final report will include information on both the pre- and post-operational sampling periods for submittal to USEPA and FDER.

5.0 Schedule

Summarized in Table 5-1 and Figure 5-1 are schedules of events surrounding the plan of study.

5.1 Field Sampling

On a monthly basis, field samples will be collected during pre and post operational periods.

5.2 Analysis

Analysis of data collected by field crews shall be analyzed within 30 days.

5.3 Reports

Final report is due within four months after completion of post-operation data collection.

Table 5-1 Milestone Dates - Salt Drift Plan of Study

Date	Activity
Dec. 1980	File Plan of Study - EPA and FDER
Jan. 1981	EPA and FDER Approval
Jan. 1981	Request for Proposals
Mar. 1981	Select Vendor(s)
May 1981	Commence Pre-Operation Study
May 1982	Complete Pre-Operation Study
June 1982	CR 4 Cooling Tower Heat Testing
Dec. 1982	CR 4 Commercial Operation
Dec. 1982	Commence Post-Operation Study
Dec. 1983	Complete Post-Operation Study
Apr. 1984	File Report With FDER and EPA

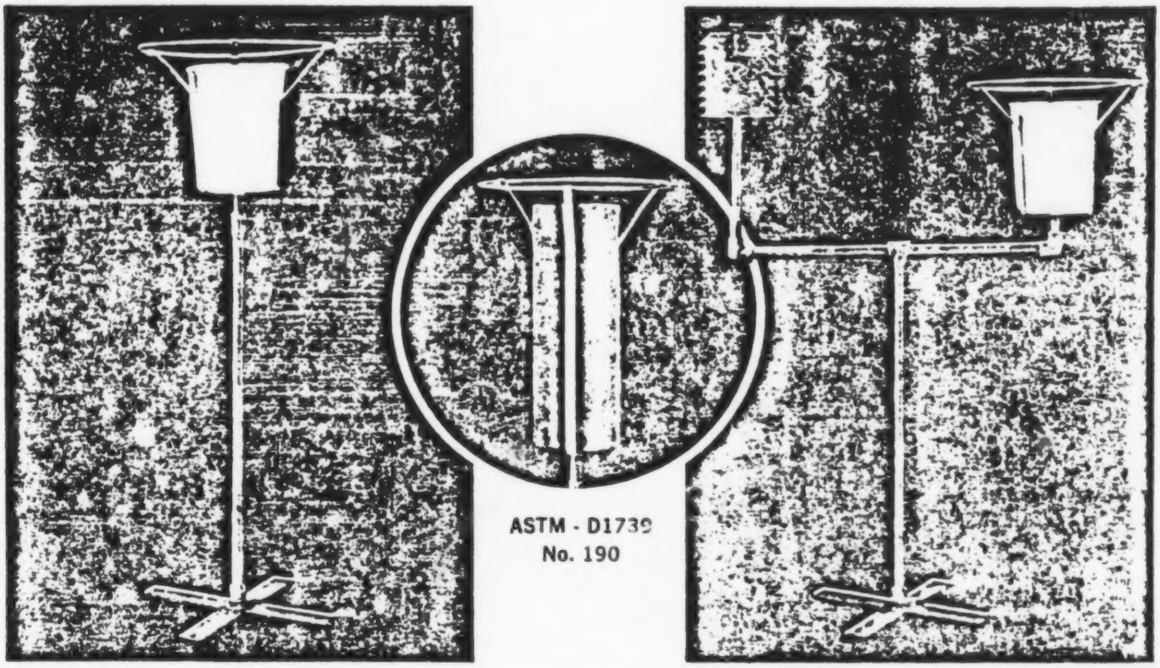
6.0 Appendix

DUST-FALL
AND SO_2 STANCHION

RAC

Reliable Accurate Control

BULLETIN 2323-B



ASTM - D1739
No. 190

Stanchion with Dust Fall Jar Holder Only

Stanchion with Dust Fall Jar Holder and SO_2 Candle Shelter

Stanchion with the bird-ring support complies with Air Pollution Control Association (APCA) recommended specifications for dust fall holders. Suitable for supporting the RAC No. 170 or No. 190 dust fall jars and the SO_2 (lead candle) shelter. Bird ring recommended to reduce contamination of sample by birds roosting on edge of jar.

Stanchion made to position top of jar 48" above floor level of base. Construction is such that entire stanchion can be assembled and dis-assembled by using small allen wrench. Base may be anchored by screws or sand bags. Jar holder is aluminum. Upright, cross members and fittings are aluminum, the base is painted steel. SO_2 candle shelter is black polyethlene.

Complete stanchion (Fig. 2) includes all pipes, cross member base, jar holder (including bird ring), No. 170 dust fall jar (including snap-on lid and carrying handle), and complete SO_2 lead peroxide candle station catalog number 2282 (includes louvered shelter, candles, transporting tubes, lead peroxide, and gauze).

Meets ASTM D1739 (for Dust Fall) and D2010 (for SO_2)

ORDERING INFORMATION

Please specify:
Dust Fall and SO_2 Stanchion Catalog Number 2323-A
Dust Fall less SO_2 Stanchion Catalog Number 2323-B
Dust Fall less SO_2 Stanchion and Dust Fall Jar Catalog Number 2323-C
Extra Dust Fall Jars Catalog Number 170 or Catalog Number 190
Extra SO_2 Louvered Shelters Only Catalog Number 2282-IA

RESEARCH APPLIANCE CO., Gibsonia, Pa., U.S.A. 15044 (412) 443-5935

ATTACHMENT 2

SYSTEM DESCRIPTION
FOR
CIRCULATING WATER MAKEUP AND BLOWDOWN SYSTEM

FLORIDA POWER CORPORATION
CRYSTAL RIVER PLANT
UNITS 4 AND 5

FUNCTION

The function of the Circulating Water Makeup and Blowdown System is to provide makeup water to the Circulating Water Systems of Units 4 and 5 and to provide the means for removal of the blowdown water from the same systems. Makeup water is required to replace circulating water lost due to evaporation, drift, and blowdown. Blowdown from the Circulating Water Systems is required to maintain circulating water quality.

SYSTEM COMPONENTS

The Circulating Water Makeup and Blowdown System is comprised to two sets of pumps and two channels. The first set of pumps, identified as the Circulating Water Intake Pumps in Figure 2, are located in the circulating water discharge canal for the existing Units 1, 2, and 3. The intake pumps transfer sea water from the existing discharge canal to the intake channel for Units 4 and 5. There are three full-capacity intake pumps with each pump capable of supplying the required makeup water flow for one unit's circulating water system.

The second set of pumps, identified as the Circulating Water Makeup Pumps in Figure 2, are located between the Unit 4 and 5 cooling towers. The makeup pumps transfer sea water from the intake channel to the circulating water pump suction flumes where the water enters the circulating water system. There are three full-capacity makeup pumps with each pump capable of supplying the required makeup water flow for one unit's circulating water system.

The intake channel, as indicated in Figure 2, conveys the makeup water from the intake pump structure to the makeup pump structure. The intake channel is a concrete lined flume approximately seven (7) feet deep. The channel bottom is twenty (20) feet wide and is at a constant elevation of 93'-0".

The blowdown discharge channel, as indicated in Figure 2, conveys the blowdown water from the Unit 4 and 5 cooling towers to the Units 1, 2, and 3 Circulating Water Discharge Canal. The blowdown discharge channel is a concrete lined flume approximately seven (7) feet deep with a twenty (20) feet wide sloping bottom. The bottom slopes from an elevation of 93'-0" at the cooling towers to an elevation of 90'-0" at the inlet to the discharge structure. The blowdown discharge channel is designed to convey the maximum Circulating Water System blowdown flows plus the plant retention canal overflow resulting from a 50 year, 24 hour, occurrence rainfall event.

To prevent overflowing the intake channel during situations such as a makeup pump trip when one or two intake pumps are still operating, an overflow channel connecting the intake and blowdown discharge channels is provided. The overflow channel, as indicated in Figure 2, is located just ahead of the makeup pump structure. The overflow channel is concrete lined, approximately two (2) feet deep, and has a fifteen (15) feet wide bottom at a constant elevation of 98'-0".

SYSTEM OPERATION

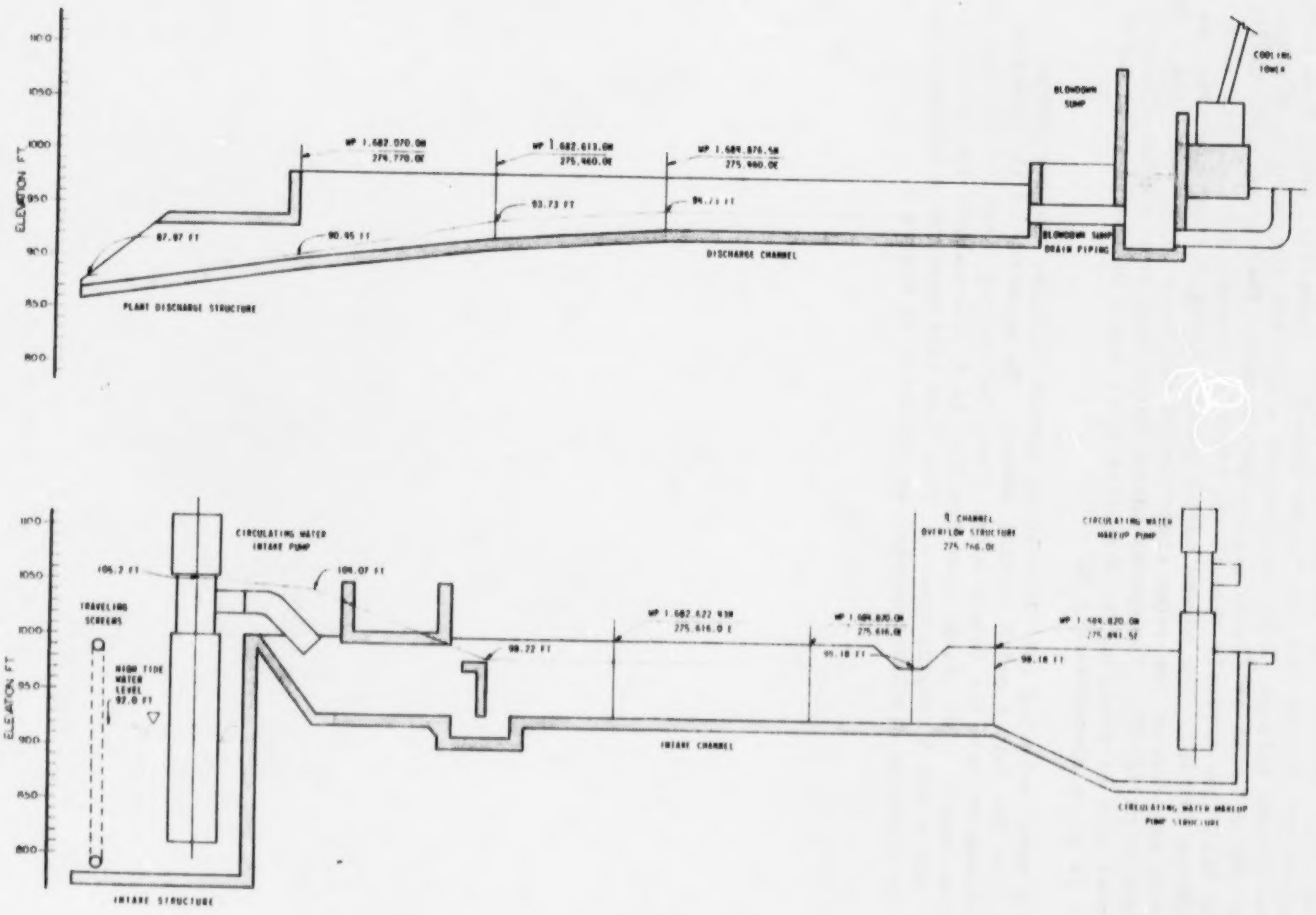
Normal operation of the Circulating Water Makeup and Blowdown System consists of the continuous operation of one intake and one makeup pump for each unit in operation. If both Units 4 and 5 are in operation then two intake pumps and two makeup pumps are required. Any two of the three intake pumps may be used to provide the makeup water requirements for both Units 4 and 5. The remaining intake pump is a standby to be used in the event one of the operating pumps fail. The three makeup pumps are arranged such that one pump is dedicated to Unit 4, one is dedicated to Unit 5, and the remaining pump can serve either Unit 4 or 5.

The Circulating Water Makeup and Blowdown System design is based on a constant rate of makeup concept, but the intake pumps take suction from the Units 1, 2, and 3 Circulating Water Discharge Canal and, therefore, are subject to the effects of the tide. Each pump is designed to provide the one unit design makeup flow of 34,000 gallons per minute when the Units 1, 2, and 3 discharge canal is at the design or normal low tide water level elevation. The design water level elevation at low tide is 88'-0". When the water level elevation in the Units 1, 2, and 3 discharge canal is above 88'-0", the intake pumps will supply more than the 34,000 gallons per minute due to the reduced suction lift. The maximum flow from the intake pumps will occur when the discharge canal is at high tide. The design or normal high water level elevation at high tide is 92'-0". Under these suction conditions, each intake pump will transfer 36,500 gallons per minute into the intake channel. The total design fluctuation of the water level at the intake pump suction is four (4) feet.

The makeup pumps take suction from the intake channel and, therefore, are subject to the effects of a fluctuating water level in the channel. Each makeup pump is designed to provide the one unit design makeup flow of 34,000 gallons per minute when the water level elevation in the intake channel is 96'-0". Operation of the makeup pumps with the intake channel water level below elevation 96'-0" would damage the pumps due to cavitation. As the intake pump flow fluctuates, the level in the intake channel will also vary. This will effect the makeup pump flow. The maximum flow from the makeup pumps will occur when the intake pumps are at their peak delivery point because the maximum water level in the intake channel occurs in this situation.

When the maximum intake channel water level occurs and the two intake and two makeup pumps are operating at maximum flow the hydraulic gradient as indicated in Figure 1 will occur over the length of the intake channel. Under these conditions, the channel water level at the makeup pumps will be at elevation 98.18' and each makeup pump will be pumping 35,750 gallons per minute into the circulating water systems. At the same time, each intake pump will be pumping 36,500 gallons per minute into the intake channel. Therefore, total flow into the intake channel will be 73,000 gallons per minute and the total flow pumped out of the channel will be 71,500 gallons per minute. The excess 1,500 gallons per minute will flow directly through the overlfow channel and into the blowdown discharge channel. The excess makeup water flowing through the overflow channel will decrease as the water elevation in the Units 1, 2, and 3 Discharge Canal drops below 92'-0". The excess makeup water flow rate through the overflow channel will be zero, unless the Units 1, 2, and 3 Discharge Canal water elevation is above approximately 90'-0".

The makeup water entering the circulating systems produces the continuous blowdown from the Unit 4 and 5 cooling towers. The quantity of the blowdown flow is dependent upon the makeup water flow, the cooling tower drift, and the evaporation losses. The design blowdown flow is 61,122 gallons per minute from both the Unit 4 and 5 cooling towers. This flow rate produces a hydraulic gradient in the blowdown discharge channel as indicated in Figure 1.


ELEVATION FT
110.0
105.0
100.0
95.0
90.0
85.0
80.0
WP 1,682,070.0N
274,770.0E
WP 1,682,613.0N
275,460.0E
WP 1,684,876.5N
275,460.0E
87.97 FT
90.95 FT
93.73 FT
94.73 FT
PLANT DISCHARGE STRUCTURE
DISCHARGE CHANNEL
BLOWDOWN SUMP
BLOWDOWN SUMP DRAIN PIPING
COOLING TOWER
TRAVELING SCREENS
HIGH TIDE WATER LEVEL 92.0 FT
105.2 FT
CIRCULATING WATER INTAKE PUMP
106.07 FT
98.22 FT
WP 1,682,622.93N
275,616.0 E
WP 1,684,820.0N
275,616.0E
95.18 FT
℄ CHANNEL OVERFLOW STRUCTURE
275,746.0E
WP 1,584,820.0N
275,891.5E
98.18 FT
CIRCULATING WATER MAKEUP PUMP
INTAKE STRUCTURE
INTAKE CHANNEL
CIRCULATING WATER MAKEUP PUMP STRUCTURE

INTAKE AND DISCHARGE
CHANNEL HYDRAULIC GRADIENT

FIGURE 1

110380

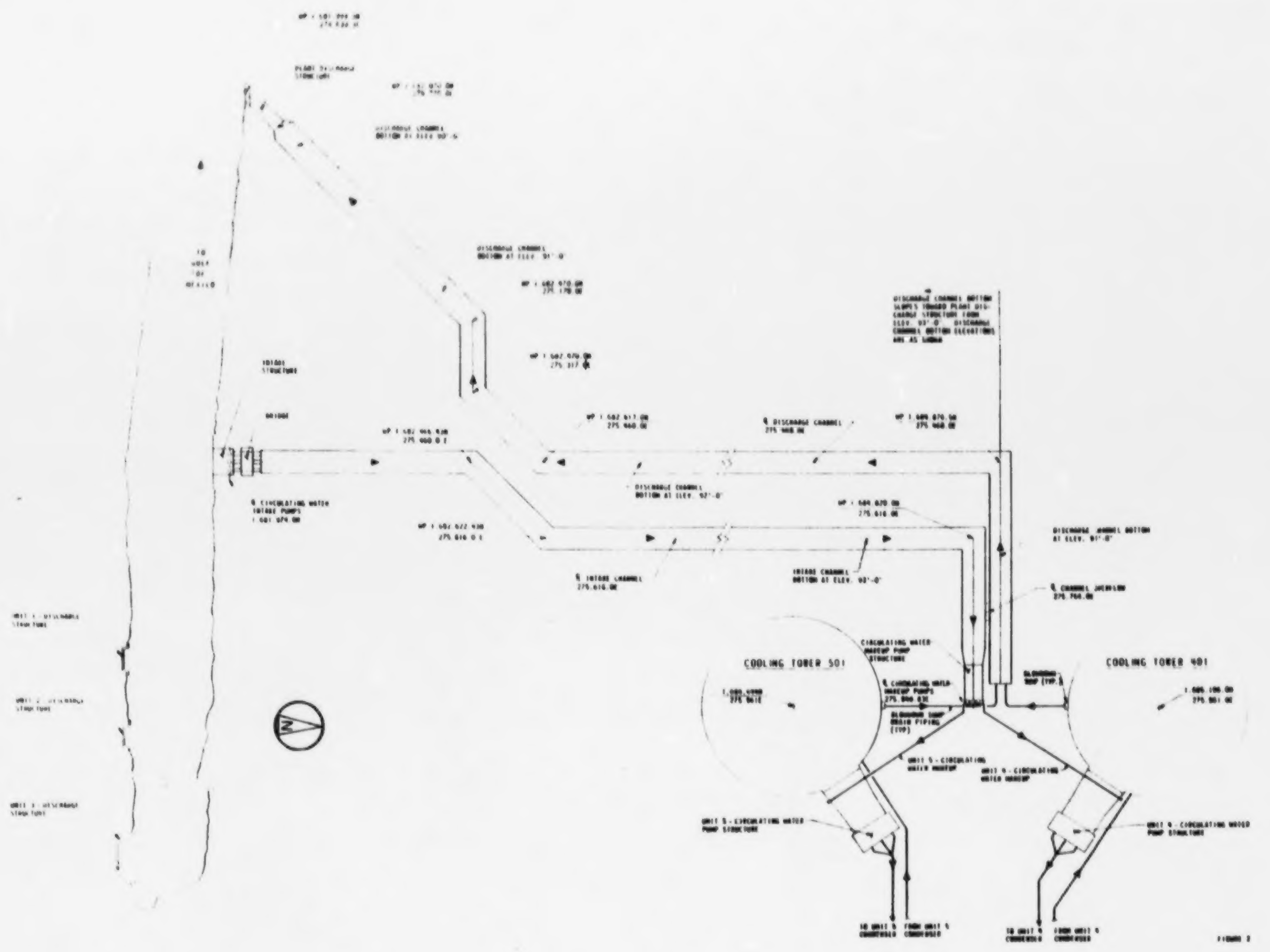

PLANT DISCHARGE STRUCTURE
DISCHARGE CHANNEL BOTTOM AT ELEV. 90'-6
TO GULF OF MEXICO
INTAKE STRUCTURE
BRIDGE
℄ CIRCULATING WATER INTAKE PUMPS
DISCHARGE CHANNEL BOTTOM AT ELEV. 91'-0
℄ DISCHARGE CHANNEL
DISCHARGE CHANNEL BOTTOM SLOPES TOWARD PLANT DISCHARGE STRUCTURE FROM ELEV. 93'-0. DISCHARGE CHANNEL BOTTOM ELEVATIONS ARE AS SHOWN
DISCHARGE CHANNEL BOTTOM AT ELEV. 92'-0"
℄ INTAKE CHANNEL
275.616.00
INTAKE CHANNEL BOTTOM AT ELEV. 92'-0"
DISCHARGE CHANNEL BOTTOM AT ELEV. 91'-0"
℄ CHANNEL JUNCTION
275.760.00
CIRCULATING WATER MAKEUP PUMP STRUCTURE
℄ CIRCULATING WATER MAKEUP PUMPS
BLOWDOWN SUMP DRAIN PIPING (TYP)
BLOWDOWN SUMP (TYP.)
COOLING TOWER 501
COOLING TOWER 401
UNIT 5 - CIRCULATING WATER MAKEUP
UNIT 4 - CIRCULATING WATER MAKEUP
UNIT 5 - CIRCULATING WATER PUMP STRUCTURE
UNIT 4 - CIRCULATING WATER PUMP STRUCTURE
TO UNIT 5 CONDENSER
FROM UNIT 5 CONDENSER
TO UNIT 4 CONDENSER
FROM UNIT 4 CONDENSER
UNIT 1 - DISCHARGE STRUCTURE
UNIT 2 - DISCHARGE STRUCTURE
UNIT 3 - DISCHARGE STRUCTURE
N

FIGURE 3

4.0 PUBLIC PARTICIPATION

The Draft Environmental Impact Statement (DEIS) was published in September 1980 and was made available to the public on September 26, 1980. The Federal Register, Volume 45, Page 63914, dated September 26, 1980, announced the availability of the DEIS and the proposed issuance of an NPDES Permit. The DEIS was provided to various federal, state, and local agencies, as well as concerned individuals, interest groups, and public officials. A public notice of the document's availability and of a public hearing on the DEIS appeared in the Suncoast Sentinal (September 24, 1980) and the Tampa Tribune (September 25, 1980).

The public hearing was held in Crystal River, Florida, on October 28, 1980. In addition to the public input afforded by the hearing (transcript provided herein), many letters were received and are included in this Final EIS.

The designations in the margins of the letters identify specific comments for which responses have been developed. These responses follow the letters. In a similar manner, the designations in the margins of the hearing transcript identify comments which have received responses. Many of the transcript comments were similar or identical to the written; consequently, some transcript responses refer to responses to written comments already presented.

Those items referenced in paragraph 3 of Florida Power Corporation's letter of November 10, 1980 (page 4-33), are included in Chapter 3 of the Final EIS. These items include the Groundwater Monitoring Program (letter of November 5, 1980) and the Circulating Water Makeup and Blowdown System Description (letter of October 31, 1980).

INDEX TO COMMENTS ON FPC CRYSTAL RIVER UNITS 4 & 5 DEIS

COMMENT NUMBER	COMMENT PAGE NUMBER	RESPONSE PAGE NUMBER	COMMENTER	DATE	NATURE OF COMMENT
DER-1	4-8	4-60	Dept. of Environmental Regulation	10/7/80	Conditions of certification modified 5/22/80
DER-2	4-8	4-60	Dept. of Environmental Regulation	10/7/80	Chlorine—State has stricter requirements than EPA Draft NPDES permit
AF-1	4-19	4-60	Dept. of Air Force	9/24/80	No impact to Air Force operations
SCS-1	4-20	4-60	Soil Conservation Service	10/9/80	No comments
FS-1	4-21	4-60	Forest Service	10/15/80	Forest management plan
FS-2	4-21	4-60	Forest Service	10/15/80	Compliance with Resource Conservation and Recovery Act
HUD-1	4-22	4-61	Dept. of Housing and Urban Development	10/27/80	Acid rain from plant operations
HUD-2	4-22	4-61	Dept. of Housing and Urban Development	10/27/80	Housing of construction workers
HLS-1	4-23	4-62	Helen L. Spivey	11/5/80	Disposal of fly ash
HLS-2	4-24	4-63	Helen L. Spivey	11/5/80	Impact of salt drift from cooling towers
HLS-3	4-25	4-64	Helen L. Spivey	11/5/80	Availability of low sulfur coal
HLS-4	4-25	4-64	Helen L. Spivey	11/5/80	Acid rain from plant operations
DI-1	4-27	4-65	Dept. of Interior	11/5/80	Impact on visibility from stack emissions on Florida trail (SW corner of Inverness)

INDEX TO COMMENTS ON FPC CRYSTAL RIVER UNITS 4 & 5 DEIS
(Continued, Page 2 of 6)

COMMENT NUMBER	COMMENT PAGE NUMBER	RESPONSE PAGE NUMBER	COMMENTER	DATE	NATURE OF COMMENT
CDC-1	4-28	4-65	Center for Disease Control	11/5/80	Objection to open burning during construction
CDC-2	4-28	4-65	Center for Disease Control	11/5/80	Groundwater monitoring programs
NRC-1	4-29	4-66	Nuclear Regulatory Commission	11/7/80	Impact from potential leachate (radioactive and heavy metals)
NRC-2	4-29	4-66	Nuclear Regulatory Commission	11/7/80	Air emission impacts—greenhouse effect and health impacts
NRC-3	4-30	4-67	Nuclear Regulatory Commission	11/7/80	Coal fuel cycle impacts—mining
NRC-4	4-30	4-67	Nuclear Regulatory Commission	11/7/80	Effects of Crystal River (CR) Units 1, 2, and 3 going closed-cycle cooling
NRC-5	4-30	4-68	Nuclear Regulatory Commission	11/7/80	Impingement on CR 1, 2, and 3 screens due to increased coal barge traffic
NRC-6	4-31	4-68	Nuclear Regulatory Commission	11/7/80	Impacts of chlorination
NRC-7	4-31	4-68	Nuclear Regulatory Commission	11/7/80	Toxic vapors from CR 4 and 5 operation on Unit 3 operators
NRC-8	4-31	4-68	Nuclear Regulatory Commission	11/7/80	CR 4 and 5 structures on local meteorology
FPC-1	4-34	4-69	Florida Power Corporation	11/10/80	De-chlorination to be used. Recommended changes to NPDES permit
FPC-1a	4-34	4-70	Florida Power Corporation	11/10/80	Proposed changes to NPDES permit
FPC-2	4-34	4-70	Florida Power Corporation	11/10/80	Eliminate cooling tower drift testing every two years

INDEX TO COMMENTS ON FPC CRYSTAL RIVER UNITS 4 & 5 DEIS
(Continued, Page 3 of 6)

COMMENT NUMBER	COMMENT PAGE NUMBER	RESPONSE PAGE NUMBER	COMMENTER	DATE	NATURE OF COMMENT
FPC-3	4-35	4-70	Florida Power Corporation	11/10/80	Revise coal lining requirement consistent with Florida site certification
FPC-4	4-35	4-71	Florida Power Corporation	11/10/80	Revise condition on correcting groundwater contamination to 90 days
FPC-5	4-35	4-71	Florida Power Corporation	11/10/80	Delete overflow event recorder for plant drains collection pond
FPC-6	4-36	4-71	Florida Power Corporation	11/10/80	No wetting agents planned for fugitive dust
FPC-7	4-36	4-71	Florida Power Corporation	11/10/80	Delete reference to acid rain
FPC-8	4-36	4-71	Florida Power Corporation	11/10/80	Reference mean annual and 100-year flood to plant datum
FPC-9	4-36	4-71	Florida Power Corporation	11/10/80	Five pumps to be used for groundwater make up
FPC-10	4-37	4-72	Florida Power Corporation	11/10/80	Inclusion of by-pass canal for cooling tower make up and blowdown
FPC-11	4-37	4-72	Florida Power Corporation	11/10/80	De-chlorination facilities to be added
FPC-12	4-38	4-72	Florida Power Corporation	11/10/80	No wetting agents planned
FPC-13	4-38	4-72	Florida Power Corporation	11/10/80	No free H_2SO_4 in blowdown contrary to wording in DEIS
FPC-14	4-38	4-72	Florida Power Corporation	11/10/80	Inclusion of by-pass canal for cooling tower make up and blowdown

INDEX TO COMMENTS ON FPC CRYSTAL RIVER UNITS 4 & 5 DEIS
(Continued, Page 4 of 6)

COMMENT NUMBER	COMMENT PAGE NUMBER	RESPONSE PAGE NUMBER	COMMENTER	DATE	NATURE OF COMMENT
FPC-15	4-38	4-72	Florida Power Corporation	11/10/80	Constant rate make up/discharge changed by by-pass canal
FPC-16	4-38	4-73	Florida Power Corporation	11/10/80	De-chlorination facilities to be installed
FPC-17	4-39	4-73	Florida Power Corporation	11/10/80	De-chlorination facilities to be installed
FPC-18	4-39	4-73	Florida Power Corporation	11/10/80	Water balance does not include water loss from dewatering bins
FPC-19	4-39	4-73	Florida Power Corporation	11/10/80	Low flow of 330,500 gpm for Units 1, 2, and 3 unconfirmed
FPC-20	4-39	4-73	Florida Power Corporation	11/10/80	Rewording suggested - "cooling tower make up water intake structures...."
FPC-21	4-39	4-73	Florida Power Corporation	11/10/80	Five wells to be used
FPC-22	4-40	4-73	Florida Power Corporation	11/10/80	Revision of well monitoring program
FPC-23	4-40	4-73	Florida Power Corporation	11/10/80	Revise chlorine monitoring frequency
FDA-1	4-47	4-74	Food and Drug Administration	11/13/80	Waters adjacent to plant are Class II rather than Class III
FDA-2	4-47	4-74	Food and Drug Administration	11/13/80	Operation of sewage treatment plant
OG-1	4-50	4-74	Office of the Governor	11/13/80	Referral of comments from DER, FG & F commission and HRS

INDEX TO COMMENTS ON FPC CRYSTAL RIVER UNITS 4 & 5 DEIS
(Continued, Page 5 of 6)

COMMENT NUMBER	COMMENT PAGE NUMBER	RESPONSE PAGE NUMBER	COMMENTER	DATE	NATURE OF COMMENT
FGFC-1	4-51	4-74	Florida Game and Freshwater Fish Commission	10/29/80	Cooling water intake location
FGFC-2	4-51	4-74	Florida Game and Freshwater Fish Commission	10/29/80	Salt drift monitoring program
FGFC-3	4-51	4-75	Florida Game and Freshwater Fish Commission	10/29/80	Groundwater monitoring program
HRS-1	4-53	4-75	Dept. of Health and Rehabilitative Services	10/14/80	No comments
CCC-1	4-54	4-75	Citrus County Civic Association	11/5/80	Objection to use of freshwater from groundwater aquifer
CCC-2	4-54	4-75	Citrus County Civic Association	11/5/80	Concern over fly ash adisposal
FWS-1	4-55	4-75	Fish and Wildlife Service	11/12/80	Cooling make up does not significantly affect impingement and entrainment
FWS-2	4-55	4-75	Fish and Wildlife Service	11/12/80	Siltation and turbidity from construction activities
FWS-3	4-56	4-76	Fish and Wildlife Service	11/12/80	Biological opinion of March 16, 1979
FWS-4	4-56	4-76	Fish and Wildlife Service	11/12/80	Drainage alteration
FWS-5	4-56	4-76	Fish and Wildlife Service	11/12/80	Salt drift impacts

INDEX TO COMMENTS ON FPC CRYSTAL RIVER UNITS 4 & 5 DEIS
(Continued, Page 6 of 6)

COMMENT NUMBER	COMMENT PAGE NUMBER	RESPONSE PAGE NUMBER	COMMENTER	DATE	NATURE OF COMMENT
FWS-6	4-56	4-76	Fish and Wildlife Service	11/12/80	Diked wetland area west of Units 1, 2, and 3
NOAA-1	4-58	4-77	National Oceanic and Atmospheric Administration	10/27/80	Severe weather
COE-1	4-59	4-77	U.S. Army Corps of Engineers, Jacksonville District	10/22/80	Wetlands; and construction of intake and outfall
COE-2	4-59	4-77	U.S. Army Corps of Engineers, Jacksonville District	10/22/80	Elevation of Lake Rousseau
COE-3	4-59	4-77	U.S. Army Corps of Engineers, Jacksonville District	10/22/80	Lake Rousseau hydroelectric power
T-1	4-109	4-122	Helen L. Spivey	10/28/80	Fly ash disposal
T-2	4-115	4-122	Helen L. Spivey	10/28/80	Sinkhole formation due to drawdown of well field

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

JACOB D. VARN
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

October 7, 1980

John E. Hagen, III.
Chief, EIS Branch
U.S. Environmental Protection
  Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia   30365

Dear Mr. Hagen:

Re: Draft EIS for Crystal River 4 & 5 and DRAFT NPDES Permit
SAI No. 81-0449E

We have reviewed the drafts and have no objections to them. Two points should be called to your attention however.

DER-1 First, the Conditions of Certification for Crystal River 4 and 5 were again modified on May 22, 1980. A copy of the order modifying the conditions and the new language for those conditions are attached for inclusion in the Final EIS.

DER-2 Second, although the NPDES permit does state the State requirements which are stricter than the NPDES permit shall prevail, you may wish to review the conditions pertaining to the discharge of chlorine from cooling tower blowdown. The NPDES permit allows continuous discharge of chlorine, while the State's conditions (Special Condition II.A.7) restrict discharge to two hours in any one day from either unit, and also prohibits discharge from #4 or #5 while any other unit is discharging chlorine.

For your information DER is planning to send a representative to the hearing on the 28th in Crystal River.

Sincerely,

Hamilton S. Oven. Jr.

Hamilton S. Oven, Jr., P.E.
Administrator
Power Plant Siting Section

HSOjr:jb

Attachment

cc: Mickey Bryant
    Walt Kolb

original typed on 100% recycled paper

Reproduced from best available copy.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

IN RE:

FLORIDA POWER CORPORATION,
CRYSTAL RIVER UNITS 4 & 5,
MODIFICATION OF CONDITIONS
OF CERTIFICATION,
CITRUS COUNTY, FLORIDA.

PA 77-09

ORDER MODIFYING CONDITIONS OF CERTIFICATION

This matter came on to be heard by the Secretary of the Department of Environmental Regulation at a duly noticed public hearing on May 22, 1980. Having reviewed the evidence and all necessary documents, and otherwise being fully advised in the premises, the Department hereby enters this Order and finds:

1. The Secretary of the Department of Environmental Regulation has the authority to enter this Order pursuant to Special Condition III C. to the Certification Order entered by the Governor and Cabinet of the State of Florida on November 21, 1978.

2. The Recommendation of the Southwest Florida Water Management District, Order No. 80-22, copy attached as Exhibit B, is in accordance with all applicable statutes and rules and regulations of the Department, the Findings of Fact contained therein are based on competent, substantial evidence, and the Conclusions of Law contained therein are correct.

Therefore be it ORDERED

1. The aforesaid Recommendation of the Southwest Florida Water Management District, Order No. 80-22, be adopted by the Department, and

2. The aforesaid Certification Order be modified in accordance with Exhibit A attached hereto and incorporated herein.

DONE AND ORDERED this 22 day of May, 1980.

Jacob D. Varn

JACOB D. VARN
Secretary

Department of Environmental
Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

FILING AND ACKNOWLEDGEMENT

FILED, on this date, pursuant to S120.52 (9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk

Date

cc: All parties

05/05/80

BEFORE THE GOVERNING BOARD
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

IN RE:

FLORIDA POWER CORPORATION)
CRYSTAL RIVER UNITS 4 & 5)
MODIFICATION OF CONDITIONS)
OF CERTIFICATION NO. PA 77-09) ORDER NO. 80-22
CITRUS COUNTY, FLORIDA)
)
PERMITTEE.)

RECOMMENDATION OF GOVERNING BOARD TO THE SECRETARY, DEPARTMENT OF ENVIRONMENTAL REGULATION, ON MODIFICATION OF SPECIAL CONDITION III OF CERTIFICATION ORDER.

This Matter came on to be heard by the Governing Board of Southwest Florida Water Management District at a Public Hearing on April 1, 1980. Said Public Hearing, being duly and properly noticed, was conducted at District Headquarters, 5060 U. S. Highway 41 South, Brooksville, Florida, and all parties hereto were present or given the opportunity to be present, and, together with the general public, were given an opportunity to present testimony and evidence. The Board, having reviewed the application and all documents in the File of Record, having heard testimony, and having received and examined all documentary evidence, makes the following

FINDINGS OF FACT:

1. The Southwest Florida Water Management District received on November 26, 1979, a request from Florida Power Corporation for modification of Special Condition of Certification III-C for its Crystal River Units 4 and 5. The Request for Modification seeks reduction of the number of wells in the freshwater well field near Route 19, Crystal River, Florida, from 21 wells to 7 wells (4 production wells and 3 stand-by wells). The modification would increase the average daily withdrawal from the production wells from 50,000 gallons per day to 262,500 gallons per day on average and from 144,000 gallons per day to not more than 756,000 gallons per day per well during any single day. There is no increase in the total withdrawal from the well field being requested.

2. Special Condition III-C attached to the Certification Order of the Governor and Cabinet for Crystal River Units 4 and 5 authorizes the Department of Environmental Regulation to modify the withdrawal limitations

on the freshwater well field associated with these new units provided the Southwest Florida Water Management District concurs and provided the new withdrawal rates do not cause a violation of Southwest Florida Water Management District regulations.

3. The Request for Modification from Florida Power is equivalent to an increase from an average withdrawal rate of 50,000 gallons per day per well to 252,500 gallons per day per day per well and an increase on maximum withdrawal rates from 144,000 gallons per day per well to 756,000 gallons per day per well. This Request for Modification has been handled by District staff as though it were a request for modification of a consumptive use permit.

4. The proposed modified locations for authorized withdrawals in the quantities of 1,000,000 gallons per day (average annual) at quantities not to exceed 3,000,000 gallons per day have been assessed as a composite withdrawal site in accordance with the Southwest Florida Water Management District Consumptive Use Permitting criteria set forth in Section 16J-2.11, Florida Administrative Codes; and, based upon supporting documentation submitted by Florida Power Corporation, and the evaluation of such data by staff of the District:

(a) The proposed withdrawal will not cause the rate of flow of a stream or other watercourse to be lowered below the minimum rate of flow established by the Board.

(b) The proposed withdrawal will not cause the level of the potentiometric surface to be lowered below the regulatory level established by the Board.

(c) The proposed withdrawal will not cause the level of the surface of water to be lowered below the minimum level established by the Board.

(d) The proposed withdrawal will not significantly induce salt water encroachment.

(e) The proposed withdrawal will not cause the water table to be lowered so that the lake stages or vegetation will be adversely and significantly affected on lands other than those owned, leased or otherwise controlled by the applicant.

(f) The proposed withdrawal will not cause the level of the potentiometric surface under lands not owned, leased or otherwise controlled by the applicant to be lowered more than five feet (5').

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(g) The proposed withdrawal will not cause the level of the water table under lands not owned, leased or otherwise controlled by the applicant to be lowered more than three feet (3').

(h) The proposed withdrawal will not cause the level of the surface of water in any lake or other impoundment to be lowered more than one foot (1') unless the lake or impoundment is wholly owned, leased or otherwise controlled by the applicant.

(i) The proposed withdrawal will not cause the potentiometric surface to be lowered below sea level.

(j) The proposed withdrawal will not exceed the water crop of lands owned, leased or otherwise controlled by the applicant.

5. A copy of a proposed Modified Special Condition III is attached hereto as Exhibit 1, and made a part hereof by reference. Conditions which have been fully executed have been deleted and some wording has been clarified. Special Condition III-C has been modified to authorize withdrawals from any of seven (7) wells designated PW-1 through PW-7, with each well limited nevertheless to an average withdrawal rate of 252,500 gallons per day (average annual) and a maximum withdrawal rate of 756,000 gallons during any single day. The total authorized combined withdrawal remains unchanged at an average withdrawal rate of 1,000,000 gallons per day (average annual) with a maximum combined rate not to exceed 3,000,000 gallons per day.

6. In light of the fact that modification of Condition III-C will shift the center of withdrawals, it is appropriate that modification to Special Condition III-F, relating to Monitoring and Report be also accomplished. It is proposed that Special Condition III-F.3. be modified to provide that Wells MZ-2I, MZ-2D and PW-7 be maintained as continuously recording water level monitor wells, and that Wells MZ-2S, MZ-1S, MZ-1I and MZ-1D be manually measured monthly. Reports will be submitted monthly instead of quarterly.

7. It is further appropriate that Special Condition III-F.1. be modified to current flow measuring standards to provide for greater accuracy of data, and that both Special Condition III-F.2. and III-G. be modified to provide for monthly reporting of metered pumpage and total monthly use.

8. It is further appropriate that Special Condition III-F.4. be modified, in light of now known actual withdrawal points, to reduce the number of water quality monitoring wells and to specifically designate Wells MZ-2I and MZ-2D, in addition to all production wells, for water quality sampling.

9. Two Objections have been received in response to notice of this pending application for modification of Special Condition III-C of Certification. Each of the Objectors own property approximately one-half mile south of FPC's property line. It has been calculated that the potentiometric surface at FPC's south property line will be lowered less than two feet as a result of FPC's withdrawals at the average authorized withdrawal rate and less than three feet at the maximum withdrawal rate. The resultant lowering of the static water levels in the Objectors water wells will be less than three inches during average withdrawals and less than one foot during maximum withdrawals. The change proximately resulting from the reduction in the number of withdrawal points previously authorized and the consequent increase in withdrawal rate per well, as this change is related to potential for interference with the Objector's legal use of water, is less than one-half foot.

In accordance with the foregoing, and in consideration of applicable laws and regulations, the Board makes the following

CONCLUSIONS OF LAW:

10. The Applicant has established that the intended consumptive use:

a) is a reasonable-beneficial use;

b) is consistant with the public interest; and

c) will not interfere with any legal use of water existing at the time of the application.

11. The intended consumptive use is in compliance with the requirements of Chapter 373, Florida Statutes, and Chapter 16J, Florida Administrative Code.

Wherefore, upon consideration, it is

ORDERED

12. That this Order and Exhibit 1 attached hereto be and it is hereby accepted and approved by this Board as its recommendation to the Secretary, Florida Department of Environmental Regulation, for Modification of Special Condition III of Certification for Crystal River Units 4 and 5.

13. That General Counsel is authorized and directed to do all legal acts necessary to accomplish this action of the Baord, including such Stipulations as may facilitate such Modifications.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

DATE: May 5, 1980

DERRILL S. McATEER, CHAIRMAN

ATTEST:

N. BROOKS JOHNS, SECRETARY

SEAL

Director Regulatory

Staff Attorney

Board Counsel

FILED WITH CLERK, SWFWMD
ON May 15, 1980

AS CLERK, SWFWMD

05/05/80 wp4

III. Groundwater

A. The use of groundwater from a linear wellfield for plant service water for Units 4 and 5 shall be minimized to the greatest extent practicable, but in no case shall exceed 3 mgd on a maximum daily basis from any new wells or 1.0 mgd on an average annual basis.

B. Well Criteria

The submission of well logs and test results and location design and construction of wells to provide plant service water shall be in accordance with applicable rules of the Department of Environmental Regulation and the Southwest Florida Water Management District (SWFWMD). Total water use per month shall be reported ~~quarterly~~ monthly to SWFWMD commencing with the start of construction.

*C. Well Withdrawal Limits

FPC is authorized to make a combined average annual withdrawal of 1,000,000 gallons of water per day with a maximum combined withdrawal rate not to exceed 3,000,000 gallons during a single day. Withdrawals may be made from a linear wellfield consisting of up to ~~Twenty-one (21)~~ seven (7) wells whose locations are prescribed in the table below.

FPC Well No.		WITHDRAWAL POINT LATITUDE	WITHDRAWAL POINT LONGITUDE	GALLONS PER DAY MAXIMUM		GALLONS PER DAY AVERAGE	
~~1~~	PW-1	28 57 36	82 37 48	~~144,000~~	756,000	~~50,000~~	262,500
~~2~~	PW-2	28 57 36	82 37 42	~~144,000~~	756,000	~~50,000~~	262,500
~~3~~	PW-3	28 57 36	82 37 36	~~144,000~~	756,000	~~50,000~~	262,500
~~4~~	PW-4	28 57 36	82 37 30	~~144,000~~	756,000	~~50,000~~	262,500
~~5~~	PW-5	28 57 36	82 37 24	~~144,000~~	756,000	~~50,000~~	262,500
~~6~~	PW-6	28 57 36	82 37 18	~~144,000~~	756,000	~~50,000~~	262,500
~~7~~	PW-7	28 57 36	82 37 12	~~144,000~~	756,000	~~50,000~~	262,500
~~8~~		28 57 37	82 37 07	~~144,000~~	3,000,000	~~50,000~~	1,000,000
~~9~~		~~28-57-37~~	~~82-37-01~~	~~144,000~~		~~50,000~~	
~~10~~		~~28-57-37~~	~~82-36-56~~	~~144,000~~		~~50,000~~	
~~11~~		~~28-57-37~~	~~82-36-51~~	~~144,000~~		~~50,000~~	
~~12~~		~~28-57-37~~	~~82-36-46~~	~~144,000~~		~~50,000~~	
~~13~~		~~28-57-37~~	~~82-36-40~~	~~144,000~~		~~50,000~~	
~~14~~		~~28-57-44~~	~~82-36-35~~	~~144,000~~		~~50,000~~	
~~15~~		~~28-57-44~~	~~82-36-29~~	~~144,000~~		~~50,000~~	
~~16~~		~~28-57-44~~	~~82-36-24~~	~~144,000~~		~~50,000~~	
~~17~~		~~28-57-44~~	~~82-36-18~~	~~144,000~~		~~50,000~~	
~~18~~		~~28-57-44~~	~~82-36-13~~	~~144,000~~		~~50,000~~	
~~19~~		~~28-57-44~~	~~82-36-07~~	~~144,000~~		~~50,000~~	
~~20~~		~~28-57-45~~	~~82-36-01~~	~~144,000~~		~~50,000~~	
~~21~~		~~28-57-45~~	~~82-35-56~~	~~144,000~~		~~50,000~~	
				~~3,000,000~~		~~1,000,000~~	

~~After wells have been constructed, Southwest Florida Water Management District will evaluate the individual wells and may recommend to the Department authorization of increase withdrawals based upon hydrologic characteristics for the individual wells provided that the provisions of rules of the District relating to drawdown at the boundary of the property shall be observed. The Department pursuant to Section 403.516, F.S. may modify the above withdrawal limitations with the concurrence of SWFWMD.~~

*Revised 5/5/80

EXHIBIT 1 PAGE 1 OF 3

D. Water Use Restriction

Said water is restricted to uses other than main steam condensing. Any change in the use of said water will require a modification of this condition.

E. Emergency Shortages

In the event an emergency water shortage should be declared pursuant to Section 373.175 or 373.246, F.S., by Southwest Florida Water Management District for an area including the location of these withdrawal points, the Department pursuant to Section 403.516, F.S., may alter, modify, or declare to be inactive, all or parts of Special Condition III, A-G. An authorized Water Management District Representative, at any reasonable time, may enter the property to inspect the facilities.

F. Monitoring and Reporting

FPC shall, within the time limits hereinafter set forth, complete the following items, and if it fails to complete them by the specified time, then Special Condition III A-G shall automatically become null and void.

1. FPC shall install ~~propeller-drive flow meters in compliance with SWFWMD specifications on all production wells,~~ and continuously maintain totalizing flow measurement devices on withdrawal points, as listed. Said devices shall have and maintain an accuracy within five percent of the actual flow under the installed operating conditions.

   ~~Said meter shall be installed prior to commencement of withdrawal.~~

   Permittee shall notify the District upon completion of new installation prior to commencement of withdrawal.

   Alternative flow measuring systems may be substituted upon written approval by the Director of the Regulatory Division of SWFWMD in advance of installation.

2. FPC shall submit to SWFWMD, on forms available from the District, a record of pumpage for each meter installed in F.1. above. Said pumpage records shall be provided on a monthly basis~~,~~. ~~and shall be submitted by April 15, July 15, October 15, and January 15, for each preceding calendar quarter.~~ Reports will be sent to:

   Chief, ~~Technical Information Service~~ Processing and Records
   Southwest Florida Water Management District
   5060 U.S. Highway 41, South
   Brooksville, Florida 33512

3. FPC shall maintain and operate continuous water level recorders on wells ~~SWM-1, MG-1, and MG-1~~ MZ-2I, MZ-2D, and PW-7 located at Florida POwer Corporation pump test site in Citrus County, Florida. ~~Water levels shall be monitored only in the deep zone MG-1D of well MG-1. FPC shall construct an additional monitor well similar to MG-1 with any construction modifications approved by the SWFWMD staff, to be located within its right-of-way on U.S. Highway 19. Such additional monitor well shall be designated as MG-2 and FPC shall maintain and operate continuous water level recorders to monitor the intermediate zone MG-2I and the deep zone MG-2D of well MG-2.~~ shall manually measure water levels monthly in wells MZ-2S, MZ-1S, MZ-1I and MZ-1D. Detailed hydrographs of water level fluctuations shall be constructed with the data collected from the water level recorders and shall be submitted to SWFWMD ~~April 15, July 15, October 15, and January 15 for each preceding calendar quarter.~~ monthly.

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4. Water quality analysis shall be performed on water withdrawn from each production well and from ~~the shallow (MZ-1S and MZ-2S), intermediate (MZ-1I and MZ-2I), and deep (MZ-1D and MZ-2D) zones in Monitor Wells MZ-1 and MZ-2. Water withdrawn from MZ-1S and MZ-2S shall be supplied from that portion of the Floridan Aquifer between 60' and 215' below land surface. Water withdrawn from wells MZ-1I and MZ-2I shall be supplied from that portion of the Floridan Aquifer between 360' and 372' below land surface. Water withdrawn from well MZ-1D and MZ-2D shall be from that portion of the Floridan Aquifer between 472' and 498' below land surface.~~ wells MZ-2I and MZ-2D. The water samples collected from each of the referenced wells shall be collected immediately after removal by pumping of a quantity of water equal to two casing volumes. ~~As monitor well MZ-2 is being constructed the FPC and staff of SWFWMD may determine and adjust the intervals to be monitored in accordance with hydrologic conditions determined from drilling logs.~~ The water quality analyses shall be performed monthly during the first year of operation, four times (January, May, September, and December) during the second year and twice each year (May and September) thereafter. Results shall be submitted to SWFWMD by the fifteenth (15th) day of the month following the month during which such analyses were performed. Testing for the following constituents is required:

Calcium
Potassium
Chloride
Specific Conductance
Radium 226 (only if gross Alpha is greater than 15 pci/l)

Magnesium
Bicarbonate
Nitrate
Gross Alpha Radiation

Sodium
Sulfate
Total Dissolved Solids
Total Phosphate

~~The design and location of wells MZ-1 and MZ-2 shall be as indicated by the attached Figures 1 and 2 respectively or as modified by the staff of SWFWMD.~~

5. In the event that SWFWMD determines there is a significant change in the water quality, the Department pursuant to Section 403.516, F.S., may require the permittee to reduce or cease withdrawal from these groundwater sources.

6. Minimum Water Level Restrictions

The Department and SWFWMD may, at a future date pursuant to Section 403.516, F.S., establish a minimum water level in the aquifer or aquifers hydrologically associated with these withdrawals, which may require FPC to reduce or cease withdrawal from these groundwater sources at times when water levels fall below these minimums.

EXHIBIT I Page 3 of 3

DEPARTMENT OF THE AIR FORCE
REGIONAL CIVIL ENGINEER, EASTERN REGION (HQ AFESC)
526 TITLE BUILDING, 30 PRYOR STREET, SW
ATLANTA, GEORGIA 30303

REPLY TO ATTN OF: ROV2

24 September 1980

SUBJECT: Draft Environmental Impact Statement (DEIS) - Florida Power Corporation, Crystal River Units 4 and 5

TO: Environmental Protection Agency
Region IV
ATTN: Mr. John E. Hagan, III
Chief, EIS Branch
345 Courtland Street, N. E.
Atlanta, Georgia 30365

1. The subject DEIS will have no adverse environmental impact on Air Force operations. **AF-1**

2. Thank you for giving us the opportunity to review this DEIS.

Thomas D. Sims

THOMAS D. SIMS
Chief
Environmental Planning Division

United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 1208
Gainesville, FL 32602

October 9, 1980

U.S. Environmental Protection
Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

ATTN: Mr. John E. Hagan, III
Chief, EIS Branch

Dear Mr. Hagan:

RE: Draft Environmental Impact Statement
Florida Power Corporation
Crystal River Units 4 and 5

SCS-1 We have reviewed the subject draft environmental impact statement and we have no constructive comments to offer.

We appreciate the opportunity to review and comment.

Sincerely,

William E. Austin
State Conservationist

The Soil Conservation Service
is an agency of the
Department of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
1720 Peachtree Street, N.W.
Atlanta, Georgia 30367

October 15, 1980
1950

Mr. John E. Hagan
Chief, EIS Branch
U.S. Environmental Protection Agency
345 Courtland Street, N.W.
Atlanta, Georgia 30365

Dear Mr. Hagan:

We have reviewed the draft EIS of Florida Power's proposed Crystal River Power Plant Units 4 and 5 and offer the following comments.

We commend the writers of the draft EIS and the 2 volumes of technical support documents for the thorough and in-depth data collection and analysis, especially Volume 1, Chapter 2.0. It is suggested that Florida Power contact the Florida Division of Forestry, Florida Department of Agriculture and Consumer Services, Collins Building, Tallahassee, Florida 32304 and request the services of a County service forester to evaluate and prepare a forest management plan and prescription for the Citrus River property. There is a wide diversity of ecosystems found in this area with a large number of trees, plants, fish, animals, and aquatic ecosystems. With proper forest, wildlife, water, and other resource management, the property could be improved environmentally from both the aesthetic and biological standpoint. Since the area supports the growth of slash pine and eastern red cedar, silvicultural measures should be employed to encourage the growth of these tree species on the property. **FS-1**

It is assumed that the law and regulations of RCRA (Resource Conservation and Recovery Act PL 94-580, section 4001 solid wastes) will be complied with in the treatment and disposal of wastes and waste water from these generating units. **FS-2**

We appreciate the opportunity to review this draft EIS and look forward to receiving a copy of the final EIS.

Sincerely,

ROBERT D. RAISCH
Area Director

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
ATLANTA REGIONAL OFFICE
RICHARD B. RUSSELL FEDERAL BUILDING
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303

REGION IV

October 27, 1980

IN REPLY REFER TO:
4C

U.S. Environmental Protection Agency
Attn: Mr. John E. Hagen, III
Chief, EIS Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Gentlemen:

Subject: FL0036366

The Draft Environmental Impact Statement for the proposed construction of two 695MW coal-fired electric generating plants, at the existing Crystal River complex in Citrus County, Florida, has been reviewed by the appropriate HUD offices in Region IV. The review has indicated that the proposed construction would not generate a direct impact on existing or proposed HUD projects.

HUD-1 However, HUD does consider the acid rain created as a result of the plant operation to be an important consideration. What impact would there be upon the individuals living and working in the area surrounding the proposed site? Also of concern would be the impact of the acid rain upon plant and animal life, and more specifically the agricultural crops in the area. Although this phenomenon is being studied extensively, the effects should be well considered and discussed.

HUD-2 The housing of the workers during construction is an additional concern that should be addressed. Will these workers be from the immediate area, or will they come from long distances, and require housing for their work? More discussion should be included concerning these construction workers, and the socioeconomic impact that the proposed project will have upon the community during and after construction.

We appreciate the opportunity of reviewing and commenting on this DEIS.

Sincerely,

Geraldine G. Thompson
Geraldine G. Thompson
Regional Administrator

AREA OFFICES
ATLANTA, GEORGIA · BIRMINGHAM, ALABAMA · COLUMBIA, SOUTH CAROLINA · GREENSBORO, NORTH CAROLINA · JACKSON, MISSISSIPPI
JACKSONVILLE, FLORIDA · KNOXVILLE, TENNESSEE · LOUISVILLE, KENTUCKY

November 5th, 1980

940 NW 5th Terrace,
Crystal River, Florida 32629

John E. Hagan, III,
Chief, EIS Branch,
Enviornmental Protection Agency,
Region IV,
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Draft EIS, NPDES Permit for
Florida Power Corporation
Crystal River Units 4&5

Dear Sir:
I would like to make the following comments on the above mentioned EIS statement and register objections to several portions of the proposed NPDES permit draft.

FLYASH I found conflicting statements in a number of places in the EIS regarding flyash disposal. I also found statements that were not consistant with the precautions being taken for disposal at the Florida Power Corporation (FPC) site, as opposed to off-site disposal.
In one place it states all ash will be contained on a 95 acre site at the FPC property. In another it states FPC will dedicate it's remaining acerage , in the event the 95 acres is not enough. In other places it speaks of having to market 26% of the flyash and if it cannot, then disposal "off-site" will be sought.

HLS-1

An extensive monitoring program is described in the EIS and the draft permit for the on-site ash disposal area, yet elsewhere in the EIS text it speaks to FPC's selling the flyash and lists as market possibilities, among other things, "fill for developement". (Chap 3-80) I find this inconsistant with the precautions being taken to monitor the leachate "on-site" because it is uncertain how harmful it will be, yet no precautions are being taken for however much FPC gives away or pays to have hauled away "off-site". Granted there is a lot of flyash in a 20 acre pile 40 feet high, but at least it is above ground. In the 50 years I've lived in Florida (born in Orlando) I've seen some mighty big holes "filled for developement", including about half the bays in the state. I spoke at the hearing a few weeks ago about an incident where a fill contractor filled a cypress swamp at Hall's River with fly ash and then covered it with sand so that it appeared to be a normal fill when the Fla. DER inspector arrived in response to complaints. He did discover evidence of fly ash about the fill, and the man lacked a permit of any kind to fill, so the ash was removed. FPC contends that the matter has nothing to do with this permit because the fly ash was from units 1+2. If, as is stated in the EIS, they can accomodate the flyash from 1,2,4&5 for 26 years of the proposed 30 year life of units 4+5, how come they're trucking away the ash for 1+2 now? And what of the 4 years left when they run out of room ? If they can sell it or give it away for fill for "developement" and it's perfectly safe, then I see no need for the extensive on-site monitoring program that will attempt to assess the harm from the flyash leachate.
This area of Florida has an abundance of surface groundwater, easily contaminated by waste, and I would like to see regulations governing the permit specifically speak to off-site disposal of

flyash, particularly for "fill for developement", unless or until your leachate monitoring program determines it is harmless. If FPC needs off-site disposal areas, then I feel that the same monitoring program should be carried out and that if it proves harmful it becomes their responsibility to relocate, not the taxpayers of this county and state. Besides off-site disposal, I feel sales of or give-aways of fly ash for "fill for developement" or land fill should be heavily regulated for enviornmental protection and the responsibility for it's use or mis-use fixed with FPC. I would strongly object to the permit not covering this possibility of off-site disposal and uses of flyash.

HLS-2

SALT DRIFT I would like to express my concern that FPC could not locate freshwater sources for it's proposed cooling towers. I spoke to a woman a few months ago, who moved here because she lived near a saltwater cooling tower up north. She said the drift killed everything for 4 or 5 miles surrounding the towers. I also feel the corrosive effects at the plant itself and on the cars of employees will be extremely costly for FPC. I do hope that they will continue to try and secure ample freshwater, without resorting to groundwater as they continue construction and get into operation. One thought I had, after reading that they considered an alternate site near Tampa and using the effluent from that city for their cooling towers, was prehaps they could encourage the cities of Citrus County, though they are small now, into seeking grant aid to pipe their effluent from their sewer systems to the FPC site for incorporation into their cooling towers. At present the effluent from these cities goes into the lakes, bays and rivers, giving nutrients to the freshwater aquatic weed growth, allowing them to grow bigger, better and faster. I realize pipe and pumping stations are expensive, but so is the chemical control of aquatic weeds. It would be an enviornmental plus to have this effluent removed from public waters, and if this effluent disposal could be extended past the 30 year life of units 4&5, would be a boon to the area, allowing added developement through expanded sewer systems.
I live 7 miles south-west of the proposed cooling towers, putting my home in the path of strong north-east storm winds and possible salt drift and other emissions from the plant. I have a large collection of bonsai trees that must, because, though they are dwarfed, they are still trees, remain out-of-doors. I have one tree styled by world-renowned bonsai-culturist, author, John Naka that is valued at close to a thousand dollars. It is 32 inches high. Pollution can kill bonsai trees the same as other trees, but salt drift can be much more deadly because of the small size of the tree. These little trees are the only work of art that is alive and our home site was selected for their protection, along with other reasons.
I realize the EIS states the salt towers are a new design which should eliminate the problem of salt drift, but a tremendous amount of harm to the habitat of a lot of wildlife, as well as my little dwarf trees, will occour if they do not work as predicted. I hope that FPC will continue to avidly locate

and identify potential freshwater sources that may prove to be enough to convert the salt towers to fresh sometime during the life of units 4&5.

LOW SULFER COAL'S AVAILIBILITY and CONSEQUENCES OF NOT BEING AVAILABLE

The EIS mentions in a number of places the possibility that low sulfer coal may not be available, but does not go to any length to assess the envicrnmental impact should it prove a reality. It states the stacks are designed to have scrubbers installed should the low sulfer coal not be available; the permit (draft) states, I think, that FPC must show a contract for the low sulfer coal for the life of the permit, 5 years. Table 9.6-9, Chap 9-194, states one of the disadvantages of using low sulfer coal is ~~that it's~~ "availibility questionable". HLS Throughout the text one can find bits and pieces suggesting the problems that will come about as a result, but nothing is really put forth as enviornmentally safe solutions. **HLS-3**
For instance scrubbers. If they are installed, it is estimated in the text, that there would be an additional 800 acres of sludge to dispose of. It does mention briefly the possibility of manufacturing gypsum from it, if it is of the proper content, through a process not quite perfected yet, or dumping it way out in the ocean, but then goes on to discuss the lengthy EIS's that would have to be made and the uncertainity of permits required, etc. If low sulfer coal's availibility is "questionable" now, what will it be like 5, 10, 15, 20, 25 years from now?

One of the disadvantages stated for not using the cooling towers was the possibility of "acid Rain". But then it goes on HLS to say that ~~the~~ our climate, plus the use of low sulfer coal with no scrubbers would allow a much higher plume, negating the possibility of the stack emissions mingling with the cooling tower fog. But nowhere does it really assess the impact of FPC having to install scrubbers, lowering their plume and risking acid rain. When one sits on a bedrock of limestone one views the prospect of acid rain with fear. **HLS-4** I have read horror stories of people at a football game in Ohio running in panic because the rain falling from the skies was so caustic it burnt their skin. I have seen the films on public television showing the destruction of forests in parts of New England, that lay in the path of emissions from Canadian power plants. Forests whose trees lay dead, and even the termites that normally eat downed timber were dead. Lakes and rivers changing their pH and no longer able to support their aquatic life.
The very backbone of the EIS is based on the thing that appears to be least certain, the availibility of low sulfer coal.
I liken it to my going to the bank to borrow a million dollars to attempt to process gold from turquoise and telling the bank that the one disadvantage to my plan is the availibility of turquoise is questionable.
Our enviornment here is worth far more than a mere million dollars, yet we are being asked to lend it on a process

that can use only low sulfer coal with safety, and the availibility of that particular coal is questionable. I do not consider it an envioenmentally safe or sound investment and I object.

FPC should be required to demonstrate that low sulfer coal will be available to it, in all probability, over the life of units 4&5 or demonstrate an enviornmentally safe method of disposing of it's scrubber sludge, said to be far more dangerous than flyash.

In the opening statements of the EIS it says that there is an uncertaininity as to what causes acid rain. Later it says Cooling towers mingling with stack emissions is suspect and in one place is stated to be a cause of acid rain. But nowhere does it give even a hint of the impact of acid rain on an enviornment like ours.

I hope with all my heart that FPC can get every chunk of low sulfer coal it needs for units 4&5. I know they have no desire to go to the expense of scrubbers, but since it appears to be something that could very well happen, I think the consequences should be discussed at much greater length than it is in the draft EIS.

Despite my critical comments and objections, I find the draft EIS and draft permit to be well thought out and encompassing. I appreciate the opportunity to speak toward what I see as inadequacies and/or omissions and hope that I have expressed constructive concerns. Since I am typing this on an electric typewriter, I am aware of the conviences of electrical power and in many instances the life or death need for it. I do not wish to be asked to sacrifice the enviornment of this area because contingency plans were not developed for the possibility of no low sulfer coal available. Let us discuss the "trade-offs" now, not put our backs to the wall 5, 10, 15 years from now. Again I would like to say I appreciate the opportunity to speak.

Most cordially,

Helen L. Spivey

Helen L. Spivey
(Mrs. William H. Spivey)

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 80/1073

NOV 5 1980

Mr. John E. Hagan, III
U.S. Environmental Protection Agency
Region IV, Water Enforcement Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Hagan:

The Department of the Interior has reviewed the draft environmental statement for Crystal River Coal Fired Generating Station, Units 4 and 5, Citrus County, Florida. We have the following comments.

An analysis of prevailing winds and potential effects of stack emissions on visibility and scenic integrity along sections of the proposed Florida National Scenic Trail should be analyzed and addressed in the final statement. A section of the proposed Florida National Scenic Trail is located in Citrus County approximately 15 miles southwest of the Crystal River site. **DI-1**

For additional consultation on the above subject matter please contact Dr. Jay Gogue, Chief Scientist FTS 242-3643 and/or Ms. Sharon Keene, Chief, Division of Scenic Rivers and Trails FTS 242-5835, National Park Service, Southeast Region, Atlanta, Georgia 30303.

Sincerely,

James H. Rathlesberger
Special Assistant to
Assistant SECRETARY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

November 5, 1980

Mr. John E. Hagan, III
Chief, EIS Branch
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Hagan:

We have reviewed the Draft Environmental Impact Statement (EIS) for Units 4 and 5, Crystal River, Florida Power Corporation. We are responding on behalf of the Public Health Service.

CDC-1 We do not have any major objections to the project as proposed. However, we do have specific concerns. In Part II-3, we object to the plans for on-site open burning of vegetative waste from land clearing operations. Every effort should be made to encourage maximum commercial utilization (saw logs, farm posts, pulpwood, etc.) of all timber resources that are cut. The remaining debris could possibly be chipped and mulched onto soil to prevent erosion. We believe open burning poses an unnecessary insult to air quality which impacts human health and, therefore, other viable alternatives need to be considered for disposing of cleared vegetative waste.

CDC-2 In Part VI-11, we have concerns with the possible contamination of groundwater by leachates from the ash storage area, coal piles, plant drains collection pond and/or the canal retention system. We hope the monitoring programs for groundwater protection in Part VII-9 of the document will prevent all possibilities of groundwater contamination.

Thank you for the opportunity of reviewing this document. We would appreciate receiving a copy of the Final EIS when it is issued.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Bureau of State Services

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 7 1980

Docket No. 50-302

U.S. Environmental Protection Agency
ATTN: Mr. John E. Hagan, III, Chief
EIS Branch
345 Courtland Street, NE
Atlanta, Georgia 30365

Dear Mr. Hagan:

Subject: NPDES Number FL 0036366

This is in response to your September 25, 1980 Public Notice inviting comments on the Draft Environmental Impact Statement (DEIS) relating to the proposed issuance of a New Source National Pollutant Discharge Elimination System Permit Number FL 0036366 for Crystal River Units 4 and 5.

It is our opinion that the DEIS is deficient in several areas. It is not clear whether or not you must discuss all of the impacts of the coal fuel cycle or even Units 4 and 5 in granting an NPDES Permit under the Clean Water Act. However, it is obvious that as a minimum you must discuss potential impacts on man through the environmental liquid pathways resulting from granting the NPDES Permit. This you have not done.

Notably absent are discussions of potential long-term impacts from leaching toxic, radioactive and carcinogenic heavy metals (e.g., Cd, Cr, Ni, Ra-226, natural uranium, Th-230) from the 95-acre on-site disposal area which is to receive 1,730,000 lbs of residual wastes daily (dewatered bottom ash, fly ash, etc). By long-term, we mean over a period of centuries during which time leaching of these metals and other chemicals to ground and surface water appears probable unless heroic efforts (e.g., clay pits and caps, with solidification and stabilization of wastes) are taken. It is our opinion a permit should not be granted without a prior commitment by the utility to employ state-of-the-art disposal pit design which will assure long-term stability of the wastes. A secondary concern is the radiological impact of Rn-222 emissions from the decay of Ra-226 (particularly if the Ra-226 is eventually leached from a vitrified state to a mobil state in the interstices of the ash pile). **NRC-1**

Since you do discuss atmospheric releases (even though they are not directly related to the NPDES Permit), for completeness you should provide estimates of the potential effects of those releases on man and the environment. The potential for environmental impacts from the "Greenhouse Effect" due to **NRC-2** incremental fossil fuel combustion should be discussed. In addition, health impacts from SO_x releases and TSP could be provided by using models EPA has used as the basis for current SO_x and particulate release standards as well as BACT. Radiological health impacts could be estimated based on EPA Report 520/7-79-006, "Radiological Impact Caused by Emissions of Radionuclides into Air in the United States" (pp. 4.4-1 through 4.4-27, August 1979).

Also for completeness, your statement should present discussions of the impacts of the balance of the coal fuel cycle (mining, processing, transportation, etc.) in support of Units 4 and 5. Such discussions should include the following:

1. Deaths, injuries, and illness to occupational workers and the public resulting from mining, processing, and transportation, combustion, and waste disposal. This should include discussion of acute disease and death, and chronic disease and latent health effects (e.g., cancer and genetic defects).

2. Estimated effects from short-term (e.g., SO_x) and long-term releases (e.g., Rn-222, toxic and carcinogenic trace metals) to air and water. **NRC-3**

3. Impacts of acid mine drainage and acid rain on the public and the environment over extended periods of time (e.g., decades and centuries).

In addition, we recommend that the preparers of the EIS review a recent NRC study entitled, "Activities, Effects and Impacts of the Coal Fuel Cycle for a 1000 Mw Electric Power Generating Plant" (NUREG/CR-1060) and consider including its salient points in the Final EIS to present a balanced assessment of coal-produced electricity.

Other Impacts

NRC-4 Minimal aquatic environmental effects are predicted for operation of CR Units 4 and 5 because makeup and blowdown will be from and to the existing CR 1, 2 and 3 discharge canal. However, we are aware that 316(a) and (b) determinations have not been completed for CR 1-3. A negative outcome of these determinations could change the present intake and discharge design. The FEIS should address this as an alternative and consider the aquatic and terrestrial effects of operation using makeup water from sources other than the CR Units 1, 2, and 3 discharge canal. If, for example, closed-cycle cooling is required at Units 1-3, their combined discharge flow may be inadequate to serve the needs of Units 4-5.

NRC-5 The direct impingement effects from operation of Crystal River Units 4 and 5 are predicted to be negligible due to the low water flow used and because the intake will be located in the existing discharge canal. However, the DEIS failed to consider the indirect effect the coal barges for Units 4 and 5 will have on impingement at Units 1-3. The NUS study referred to in the DEIS found that the number and biomass impinged of 11 species or groups were significantly greater when coal or oil barges (for Units 1 and 2) were moving in the intake canal. They also determined that the biomass of the entire group of finfish and of the commercially important stone crab was significantly higher in samples taken when barges are moving. The barges supplying coal for Units 4 and 5 will use the present intake canal three times per week. The additional impact the barge traffic will have on impingement at CR 1-3 should be addressed in the FEIS for Units 4 and 5.

The DEIS predicts little aquatic impact from chlorination of Units 4 and 5. The major factor in reducing impacts from chlorine to the biota in the discharge vicinity is the dilution effect of the once-through cooling water from Units 1-3. The DEIS, however, does not indicate what concentration of residual chlorine is already present in the existing discharge flow. Under some conditions of flow through Units 1-3 the chlorine demand of the discharge water could already be satisfied. The additional discharge of chlorinated wastes from Units 4 and 5 could result in higher concentrations in the mixing zone than predicted in the DEIS. The final EIS should consider the total impact of chlorination of all Crystal River units. **NRC-6**

Since Units 4 and 5 will be using one or more types of biocides in treating the cooling water, their supply, handling, and storage (e.g., chlorine) can pose a hazard to the safe operation of the nearby nuclear plant (Unit 3). Accidental spillage of volatile toxic materials, if allowed to evaporate and become airborne, can lead to the incapacitation of the Unit 3 control room operators in the event that the vapors reach the control room in sufficient concentrations. This type of hazard was reviewed and evaluated prior to licensing Unit 3 and a finding was made at that time that there were no toxic gas sources in the vicinity of the plant. The proposed Units 4 and 5 may create an environmental impact in terms of compromising the safe operation of Unit 3 through the introduction of toxic gas sources in the vicinity of Unit 3. This possibility should be addressed. **NRC-7**

The presence of some of the proposed major Units 4 and 5 structures (e.g., cooling towers, steam plant buildings) may have the potential of affecting the local Unit 3 site meteorology. An evaluation of the potential local meteorological changes due to Units 4 and 5 should be made to determine if the dispersion of the Unit 3 accidental releases of airborne radioactivity would be affected. **NRC-8**

Thank you for providing us with the opportunity to review this Draft Environmental Impact Statement.

Sincerely,

Daniel R. Muller, Assistant Director
for Environmental Technology
Division of Engineering

Florida
Power
CORPORATION

November 10, 1980

Mr. John E. Hagan, III
Environmental Protection Agency
345 Courtland Street NE
Atlanta, GA 30308

Dear Mr. Hagan:

Subject: Crystal River Unit Nos. 4 and 5
Comments on Draft NPDES Permit and DEIS

We are pleased to submit comments on the Draft NPDES Permit and the Draft Environmental Impact Statement (DEIS) for Crystal River Unit Nos. 4 and 5. Attachment A contains the comments on the draft permit, and Attachment B contains the comments on the DEIS.

You will note that several of our comments regarding chlorination reflect our decision to install dechlorination facilities. The permit and EIS documents should be revised to reflect this change. You will also note that several comments are purely of an editorial nature and are offered solely for your convenience.

In the interim since the public hearing in Crystal River, we have sent additional information to Mr. C. H. Kaplan in EPA. Enclosed are copies of our October 31, 1980, and November 5, 1980, submittals to him.

We are of the opinion that there exist no substantive issues in regards to the NPDES/EIS process for Crystal River Unit Nos. 4 and 5, and we look forward to its expeditious conclusion.

Sincerely,

William S. O'Brien

William S. O'Brien
Director
Environmental and Licensing Affairs

WSO/dd

Enclosures

General Office 3201 Thirty-fourth Street South • P O Box 14042, St Petersburg, Florida 33733 • 813—866-5151

ATTACHMENT A
Page 1 of 2

CRYSTAL RIVER UNIT NOS. 4 AND 5
COMMENTS ON AUGUST 28, 1980 DRAFT NPDES PERMIT

1. Part I, page 2, and Part III, page 14, item E
Those portions concerning chlorination need to be changed to reflect the following:

    a. No detectable total residual chlorine (TRC), or total oxidant residual (TOR), at the POD for Unit 4 and 5 combined cooling tower blowdown.

    b. Detectable TRC or TOR subject to continuous monitoring by amperometric titration type monitor with a limit of detection of 0.05 mg/l.

    FPC-1 c. Continuous monitoring values to be augmented by grab samples analyzed in situation by amperometric titration.

    d. Reduction of TRC will be accomplished by sulfur dioxide dechlorination of each cooling tower blowdown from Units 4 and 5.

This would eliminate the need for modeling of the mixing zone and the dye dilution studies.

Florida Power Corporation would reserve the right to operate Units 4 and 5 without running the dechlorination facilities as long as the monitoring system showed compliance at the mixing zone boundary.

Additionally, the operation of Units 1, 2, and 3 and the operation of Units 4 and 5 should not be tied together as is referenced in Part III, page 14, item E.

FPC-1a In part III, page 14, E and the permit rationale, reference is made to a 150 meter mixing zone for chlorine. Chapter 17.24(1)(F) of the Florida Administrative Code provided for chemical mixing zones in canals, rivers and streams of 800 meters in length. Mixing zones up to 150 meters for dredge and fill are also provided in Chapter 17-2.44(6), FAC.

2. Part III, Page 15 and 16, M, last paragraph
This should be changed to read as follows:

    FPC-2 "Cooling towers shall be designed and operated to assure a maximum drift rate of 0.0005% of the circulation water rate as indicated in the Draft EIS. The applicant shall submit written evidence that this performance is guaranteed by the cooling tower manufacturer. Tests showing compliance with this requirement shall be submitted within twelve months of the commercial operation of each unit. Subsequently, Florida Power Corporation will inspect each tower every two years and certify to EPA that the drift eliminators are properly installed and in good working order."

The present requirement of testing the drift elimination performance every two years is not reasonable. The drift rate test is complicated, requiring multiple measurements throughout the internal area of the cooling tower. The entire test program including development of a test procedure, measurement and interpretation of results would cost approximately $60,000. Since the fill material and drift eliminators are static components not subject to wear, there is no reason to believe that operating characteristics such as drift would change with time. Therefore, it is not economically feasible to perform this test after initial testing and acceptance.

3. Page 14, Part III, J

   This should be revised as follows, "The Permittee shall line the area of any coal pile directly associated with Units 4 and 5 if the coal contains more than 0.2% pyritic sulfur. This requirement shall be in conformance with Special Condition XII.B of Order." **FPC-3**

This language is consistant with Florida's Conditions of Certification.

4. Page 15, Part III, K

   The second paragraph should be revised to allow 90 days for FPC to develop and submit plans for corrective actions for review by Florida agencies. Special Condition II. H. 3 of the Order requires corrective action of some type, but does not require immediate action. **FPC-4**

5. Page 14, Part II, G

   Delete the requirement for an overflow event recorder for the plant drains collection pond since no overflow point exists for this facility. **FPC-5**

ATTACHMENT B
Page 1 of 5

CRYSTAL RIVER UNIT NOS. 4 AND 5
COMMENTS ON CRYSTAL RIVER 4 AND 5 DRAFT ENVIRONMENTAL IMPACT STATEMENT AND TECHNICAL SUPPORT DOCUMENTS

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Page iii, first full paragraph

ERRATA ". . .40 feet deep. . ." should read ". . .40 feet high".

Page iii, second paragraph

ERRATA Second sentence should begin "The design sulfur content. . ."

FPC-6 Last sentence should end after ". . .enclosed structures." (No wetting agents are planned.)

Page viii, first paragraph

FPC-7 On lines 15, 16, and 17, the sentence "Extensive. . .problem." should be deleted since it has no relevance to Crystal River Units 4 and 5. The following sentence on lines 17 and 18 should also be deleted in view of the final sentence of the paragraph.

Page III-21, third paragraph

FPC-8 The elevations of "mean annual flood" and the "100-year flood" should be related to the plant elevation datum (PED).

Page IV-1, third paragraph

ERRATA The last sentence in this paragraph is incorrect. The steam generator building will be about 265 feet tall.

Page V-6, first paragraph (partial)

FPC-9 In the first line, "four" should be changed to "five". The text should also be revised to state that four pumps could supply the plant, but the fifth one will provide added reliability and back up.

Page V-9, Figure 23

ERRATA The following call-outs need arrows to link them with the appropriate facility.

DISCHARGE COLLECTION STRUCTURE
INTAKE STRUCTURE
DISCHARGE STRUCTURE

Page V-12, first paragraph

Insert new paragraph ahead of first paragraph and after last paragraph on page V-8.

> "Normal operation of the makeup and blowdown system will consist of continuous operation of one intake pump and one makeup pump for each unit in operation. The system design is based on a constant rate of makeup concept, but the intake pumps' discharge rate will vary with the water level (tide) in the existing cooling water discharge canal. When the tide elevation equals or exceeds 92.0 ft PED, the cooling tower makeup water intake channel will overflow to the cooling tower blowdown discharge channel. At high tide, with both units operating, the overflow will not exceed 1,500 gpm." **FPC-10**

Page V-19, third paragraph

This paragraph should be revised to reflect Florida Power Corporation's decision to install and operate dechlorination facilities. This comment is also appropriate whenever the discharge of chlorine is discussed in the environmental documents. **FPC-11**

Page V-22, second paragraph

In the third sentence, "the containment dike" should be changed to "a catch basin". **ERRATA**

Page V-25, fourth paragraph

The third and fourth sentences (lines 6, 7, and 8) discuss solid waste storage area development in confusing terms. Metric/English conversion units may have been the cause. For correction, refer to page VI-16 which indicates that the 95 acres will be developed in 8-hectare plots (about 20 acres each). Suggest that the third sentence be revised to read, "The storage area will be developed in 8-hectare (20-acre) segments." **ERRATA**

Page V-26, Table 42

Column subheadings should be revised to clearly show "10^3 Lb/Day" or "1,000 Lb/Day." **ERRATA**

Page V-31, second paragraph

List of emission rate limitations, "Nitrogen Dioxide" should be "Nitrogen Oxides". **ERRATA**

Page V-35, Table 45

Parentheses missing on pounds/hour under Particulate Emissions. **ERRATA**

Page V-36, third paragraph

FPC-12 Item 1 mentions a wetting agent, and the last part of the paragraph discusses such agents. No wetting agents are planned, and the text should be revised to delete references to them.

Page VI-10, partial paragraph and first full paragraph

FPC-13 Both the partial paragraph at the top of the page and the next-to-the-last sentence of the next paragraph state that sulfuric acid will be a constituent of cooling tower blowdown. This is not correct. Sulfuric acid may be added to control scale, but no free H_2SO_4 will remain in the blowdown. The acid will react with alkaline constituents to form other compounds, mainly sulfates.

Page VII-5, second paragraph

ERRATA The second paragraph addresses impacts of dredging for the intake and discharge structures and mitigative measures. These impacts are construction impacts and should not be placed in the discussions of plant operation impacts and mitigation measures.

Page VII-7, last paragraph

ERRATA The sentence should be revised to read, ". . ., Part III, Conditions, requires that coal piles directly associated with Units 4 and 5 containing coal with a pyritic sulfur content greater than 0.2 percent be lined."

TECHNICAL SUPPORT DOCUMENT - VOLUME I

Page 3-7

ERRATA Second paragraph should be revised to insert "or sodded" after seeded on the first line and "or sprigged" after seeded on the third line.

Page 3-36, third paragraph

FPC-14 See comment for EIS, page V-12, first paragraph.

Page 3-42, last paragraph

FPC-15 Based on tide-caused overflows, "constant rate" should be conditioned with reference to comments on page 3-36, etc.

Page 3-48, first paragraph

FPC-16 Delete entirely. FPC has decided to install and operate dechlorination facilities.

Page 3-68, Figure 3.5-3

The catch basin drain for the truck apron should be shown as piped to an oil separator. **ERRATA**

Page 3-69, first paragraph

The description of the use of oil-water separators should be revised to state that they are used only for runoff from areas that may be subject to oil spills, not for runoff from all areas. **ERRATA**

Page 4-1, second paragraph

The second sentence is incorrect. No grouting was used for any structures. The paragraph should be expanded to reflect the addition of load-bearing fill on top of the Inglis Formation or the use of drilled piers. **ERRATA**

Page 5-21, last paragraph

This paragraph should be revised to reflect FPC's decision to install and operate dechlorination facilities. **FPC-17**

Page 5-25, Table 5.2-1

Water loss occurs when dewatering bins are emptied. This table should include that quantity of water. **FPC-18**

Page 5-28, first paragraph

The lower flow of 330,500 gpm for Units 1, 2, and 3 once-through water has not been confirmed as a minimum flow. **FPC-19**

Second paragraph, third line

1,300 should be 1,200. **ERRATA**

Page 5-37, first paragraph

The first sentence should be revised to read, "The cooling tower makeup water intake structure is designed to maintain the velocity of water entering the structure at less than 0.15 meters per second (0.5 fps). . ." **FPC-20**

Page 5-39, second paragraph

In the fourth line, after ". . . service water.", insert "However, to provide added reliability, five wells will be used." **FPC-21**

Page 5-46, second complete paragraph

ERRATA The last part of the last sentence should be revised to read, ". . . unless the confined rainfall runoff exceeds the volume of runoff resulting from a 10-year, 24-hour storm."

Page 5-52, first complete paragraph

FPC-22 The well monitoring program has been revised. The TSD is not correct.

TECHNICAL SUPPORT DOCUMENT - VOLUME II

Page 6-39, first paragraph

ERRATA The water quality monitoring program also includes the makeup water intake, Serial Number 014.

Second paragraph

FPC-23 The chlorine monitoring frequency for blowdown should be updated if the proposed revisions to the NPDES permit are accepted.

Florida
Power
CORPORATION

December 1, 1980

Mr. John E. Hagan, III
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30308

Dear Mr. Hagan:

Since submitting our comments on the Draft NPDES and EIS for Crystal River 4 and 5, we have had several discussions with Mr. Kaplan of the Thermal Analysis Branch. He has raised certain questions concerning our comments. This is to respond to those questions .

We would modify and clarify our comments as follows:

A. Chlorination

1. The augmenting manual grab samples will be performed once per week at the POD utilizing EPA's approved manual amperometric titration method to a limit of detection of 0.03 mg/l. FPC-1

2. Florida Power Corporation would reserve the right to operate Units 4 and 5 without running the dechlorination facilities as long as the monitoring system showed compliance at the POD. FPC-1

B. Cooling Tower Drift

1. The drift eliminators will be inspected every six months and certification made to EPA that they are in good working order. FPC-2

2. Since the drift elimination system is a static system and the NPDES permit is renewed approximately every five years, no further tests subsequent to the initial test should be required at this time. If the inspections reveal a problem and subsequent tests are needed, they can then be performed. With the six month inspections and certifications, EPA will have ample notice and opportunity to request a test. In fact, this would provide a more flexible and responsive program should any problems occur with the drift eliminators. FPC-2

C. Mixing Zone, Paragraph E of Part III of Draft NPDES

1. Florida Power Corporation would accept the mixing zone provided in this section. However, monitoring for the parameters of concern will be done at the POD. Should it be found that the mixing zone will need to be utilized, the required actions to show compliance at the mixing zone boundary will be undertaken. FPC-1a

Attached, for your convenience, are marked up copies of the pages of the Draft NPDES permit with our suggested changes.

These clarifications and modifications should resolve all the outstanding concerns on the draft NPDES permit. We look forward to the issuance of the final permit.

Sincerely,

William S. O'Brien

William S. O'Brien
Director
Environmental and Licensing Affairs

WSO/dd

Attachments

DRAFT

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on start of discharge and lasting through expiration the permittee is authorized to discharge from outfall(s) serial number(s) 009 and 010 - Cooling tower blowdown from Units 4 and 5, respectively.

Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Daily Average	Two-hour Average	Measurement Frequency	Sample Type
Flow-m^3/Day (MGD)	N/A	N/A	Continuous	Recorder (totalizer)
Temperature °C(°F)	N/A	35.6(96.0)	Continuous	Recorder
Total Oxidant Residuals ~~Chlorine Residuals (Free & Total)~~ mg/l	See Below		continuous ~~1/week~~ 1/	~~Multiple Grabs~~ Recorder –
Phosphorus (mg/l as P)	N/A	10.0	1/week 2/	Grab
Calcium (mg/l)	N/A	N/A	1/week	Grab
Conductivity 3/	N/A	N/A	Continuous	Recorder
Cycles of Concentration	N/A	N/A	1/week	Calculation

~~Chlorine may be discharged continuously; however, discharge of total residual chlorine shall not exceed a maximum instantaneous concentration of 0.10 mg/l.~~ There shall be no detectable discharge of Total Residual Oxidants (TOR). Operation of the dechlorination system shall be monitored to assure that excessive quantities of sulfur dioxide are not discharged.

Discharge temperature shall not exceed the lowest temperature of the recirculating cooling water prior to the addition of make-up.

There shall be no discharge of detectable amounts of materials added for corrosion inhibition (including but not limited to zinc, chromium and phosphorus) or any chemicals added which contain the 129 priority pollutants.

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored 1/day.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): discharge from each cooling tower prior to mixing with other waste streams except that temperature and TOR ~~chlorine may~~ shall be monitored ~~after combination of 009 and 010~~ in the blowdown canal prior to discharge to the site discharge cana

1/ ~~During the first two-month period of substantially full power operation of each unit, analyses shall follow each application of chlorine to the condenser cooling water system until sufficient operating experience has been obtained to assure conformance with limitations and then analysis frequency may be reduced to one day per week.~~ Manual monitoring for TOR & checkout of the continuous monitor shall be conducted not less than once per week. The continuous monitor shall have a limit of detection of not more than 0.05 mg/l and the manual method shall have a limit of detection of not more than 0.03 mg/l. During periods of inoperability of the continuous recorder, daily manual sampling will be done.

2/ Limitation and monitoring requirement are not applicable if permittee does not add compounds containing phosphorus to the condenser cooling water system.

3/ Reporting shall be in mg/l of Total Dissolved Solids.

DRAFT

E. Effluent discharge shall be designed and operated to assure compliance with Florida Water Quality Standards limitations (pH-6.0 to 8.5, ~~total residual chlorine-0.01 mg/l~~, copper 0.015 mg/1, etc.) at a distance of 150 meters (492 feet) from the point of discharge into the discharge canal under all expected operating modes of Units 1-5. Subsequent to commercial operation of each unit, field measurements (supplemented as necessary with modeling results) shall be conducted to determine the three dimensional configuration of the discharge plume, determine minimum dilution factor expected, and substantiate conformance with the 150-meter (492 foot) mixing zone. Reports on this study shall be submitted not later than 15 months after the commercial operation dates of Units 4 and 5, respectively. remove

F. Permittee shall maintain daily records of rainfall at the plant site.

G. There shall be no point source discharge of the following categories of wastes to Waters of the United States or to any waste stream which enters such Waters: construction runoff, low volume wastes (including, but not limited to wet scrubber air pollution control systems, ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, floor drainage, cooling tower basin cleaning wastes and blowdown from recirculating house service water system), metal cleaning wastes (cleaning compounds, rinse waters, or any other waterborne residues derived from cleaning any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning and air preheater cleaning and specifically including such water wash operations as hosing down boiler fireside surfaces), sanitary wastes and boiler blowdown. Event recorders shall be placed at all overflow points from evaporation/seepage ponds receiving such wastes to assure compliance with this requirement.

H. The Permittee shall implement the leachate testing and monitoring program for the ash disposal area as generally specified in Special Condition XII.A. of the State Power Plant Site Certification Order issued by the Governor and Cabinet on November 21, 1978, (hereinafter "Order") and as submitted to EPA on October 4, 1979. Status reports on the program shall be submitted monthly in conformance with the requirements of the Order. Based on results of the program, the Permittee shall select an environmentally sound ash disposal strategy acceptable to EPA and the State, provided that the disposal strategy shall meet any applicable EPA or State regulations whichever are more stringent. The Permittee shall consult with and obtain EPA and State approval prior to initiating changes in the ash disposal strategy.

I. The Permittee shall consult with EPA and the State at such time as the need for additional ash disposal site(s) or new coal storage area(s) is identified. Consultation shall be initiated at a sufficiently early time so as to provide adequate opportunity for a thorough evaluation of the environmental impacts of the proposed action. No site other than those described in the EIS shall be used for Units 4 and 5 without prior approval of the Director, Enforcement Division.

J. The Permittee shall line the area of any coal pile containing coal with a pyritic sulfur content of greater than 0.2% in conformance with Special Condition XII.B. of the Order.

DRAFT

K. The Permittee shall implement a groundwater monitoring program* designed to assess whether leachate from the plant drains collection pond, ash disposal area, and all coal piles necessary to support operation of Units 4 and 5 is significantly contaminating the groundwater. The program approved by EPA and the State shall be implemented not later than one year prior to receipt of coal for Units 4 or 5. Reporting shall be quarterly in conformance with requirements of the Order and shall commence four months after operation of the first unit.

Should the reports demonstrate significant contamination of groundwater is occurring, the Permittee shall immediately institute reasonable corrective measures acceptable to EPA and the State to mitigate the problem and to ensure that no further significant leaching occurs. These measures may include but not be limited to: sealing, relocating, or altering operations of the ash disposal area, plant drains collection pond, or coal piles. If the reports demonstrate no significant contamination is occurring, the Permittee after consultation with and approval by the Director, Enforcement Division may reduce or eliminate the monitoring program.

In the event that changes in the monitoring program become necessary such changes shall be approved by the Director, Enforcement Division and the State Director prior to institution.

L. The Permittee shall ensure that contractors, whose activities may impact manatees, instruct all personnel associated with such activities about the potential presence of manatees in the area and that all vessels associated with the project shall operate at "no wake" speeds at all times while in shallow waters of channels where the draft of the boat provides less than three feet clearance of the bottom. The Permittee shall ensure that all personnel are advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Endangered Species Act and that the contractor is notified it shall be held responsible for any manatee harmed, harassed or killed as a result of any of its activities.

The Permittee shall provide written documentation that all affected parties have been informed of this condition.

M. The Permittee shall commence a salt drift monitoring program** approved by EPA and the State at least one year prior to the operation of the first cooling tower. The program shall be of sufficient scope to document ambient levels and to allow for evaluation of the operational effects of Units 4 and 5 on vegetation in the area surrounding the Crystal River site. Program progress reports and monitoring reports shall be submitted quarterly commencing with implementation of the salt drift monitoring program. The program shall be conducted for at least two years following operation of the second tower.

---

* A detailed program (including well description and location, sampling procedures, paramaters to be assayed, and analytical methodologies) shall be submitted prior to issuance of the Final EIS and will be summarized therein.

**A detailed program shall be submitted prior to issuance of the Final EIS and will be summarized therein.

DRAFT

If the reports indicate significant impacts are occurring to the nearby area, the Permittee shall consult with EPA and the State and shall initiate reasonable corrective measures acceptable to EPA and the State to mitigate these impacts. Should the reports indicate no significant impacts are occurring to the nearby area, the Permittee after consultation with and approval by the Director, Enforcement Division may reduce or eliminate the monitoring program.

Cooling towers shall be designed and operated to assure a maximum drift rate of 0.0005% of the circulation water rate as indicated in the Draft EIS. Tests showing compliance with this requirement shall be submitted within three months of the commercial operation of each unit.* ~~Subsequent tests of each tower shall be conducted every second year with a report submitted to the Director, Enforcement Division not later than three months following the required date of testing.~~

N. In accordance with Section 306(d) of the Clean Water Act (33 USC Section 1251, et seq.) effluent limitations based on standards of performance contained in this permit shall not be made any more stringent during a ten year period beginning on the date of completion of such construction or during the period of depreciation or amortization of such facility for the purposes of Section 167 or 169 (or both) of the Internal Revenue Code of 1954, whichever period ends first. The provisions of Section 306(d) do not limit the authority of the Environmental Protection Agency to modify the permit to require compliance with a toxic effluent limitation promulgated under BAT or toxic pollutant standard established under Section 307(a) of the Clean Water Act, or to modify, as necessary, to assure compliance with any applicable ~~State~~ Water Quality Standard. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under sections 301(b)(2) (C), and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
   (1) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
   (2) Controls any pollutant not limited in the permit.
The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

O. The State of Florida Department of Environmental Regulation has certified the discharge(s) covered by this permit with conditions (Attachment B). Section 401 of the Act requires that conditions of certification shall become a condition of the permit. The monitoring and sampling shall be as indicated for those parameters included in the certification.

Any effluent limits. and any additional requirements specified in the attached state certification which are more stringent, supersede any less stringent effluent limits provided herein. During any time period in which the more stringent state certification effluent limits are stayed or inoperable, the effluent limits provided herein shall be in effect and fully enforceable.

* Add Following!
The drift elimination systems of each tower shall be ins~~ex~~pected every six months to assure they are in proper working order. Certification of such shall be made to EPA. Subsequent compliance tests shall be required only if the inspections show the need.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
FOOD AND DRUG ADMINISTRATION

Atlanta Field Office
Region IV
1182 West Peachtree Street, N.W.
Atlanta, Georgia 30309

November 13, 1980

U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365
ATTENTION: Mr. John E. Hagan, III
Chief, EIS Branch

Dear Mr. Hagan:

This letter pertains to EPA's Draft Environmental Impact Statement (NPDES#FL0036366) regarding Florida Power Corporation Crystal River Units 4 and 5.

The report incorrectly classifies the receiving waters for effluent discharge as Class III. It should be designated as Class II because shellfish are present and direct harvesting from the area for marketing purposes is approved by the Florida Department of Natural Resources. Reference is made to the attached map which depicts the "Approved" shellfish growing area adjacent to the existing power plants. **FDA-1**

It is recommended that the selected sewage treatment plant be designed and operated in such a manner as to ensure maximum protection for "Approved" shellfish growing waters adjacent to the plant site. The description of the proposed sewage treatment plant (page V-24 of the Draft EIS) states: "The secondary treatment effluent will be discharged to a percolation - evaporation pond. The pond will have a capacity of 1.12 acre - feet." It is recommended that no effluent be discharged to the shellfish growing waters. Perhaps this facility has already been designed for no effluent. This limits any concern for communicable disease in shellfish areas which might be affected during periods of high runoff rates. **FDA-2**

An additional purpose of this letter is to advise EPA and the Florida Department of Natural Resources that on construction of the plant, new domestic waste water facilities and storage areas (coal, fly ash, chemical retention and treatment basins) the State will have to resurvey the shellfish areas to determine actual types, quantities, and extent of pollutants flowing into the growing area and relocate closure lines if necessary.

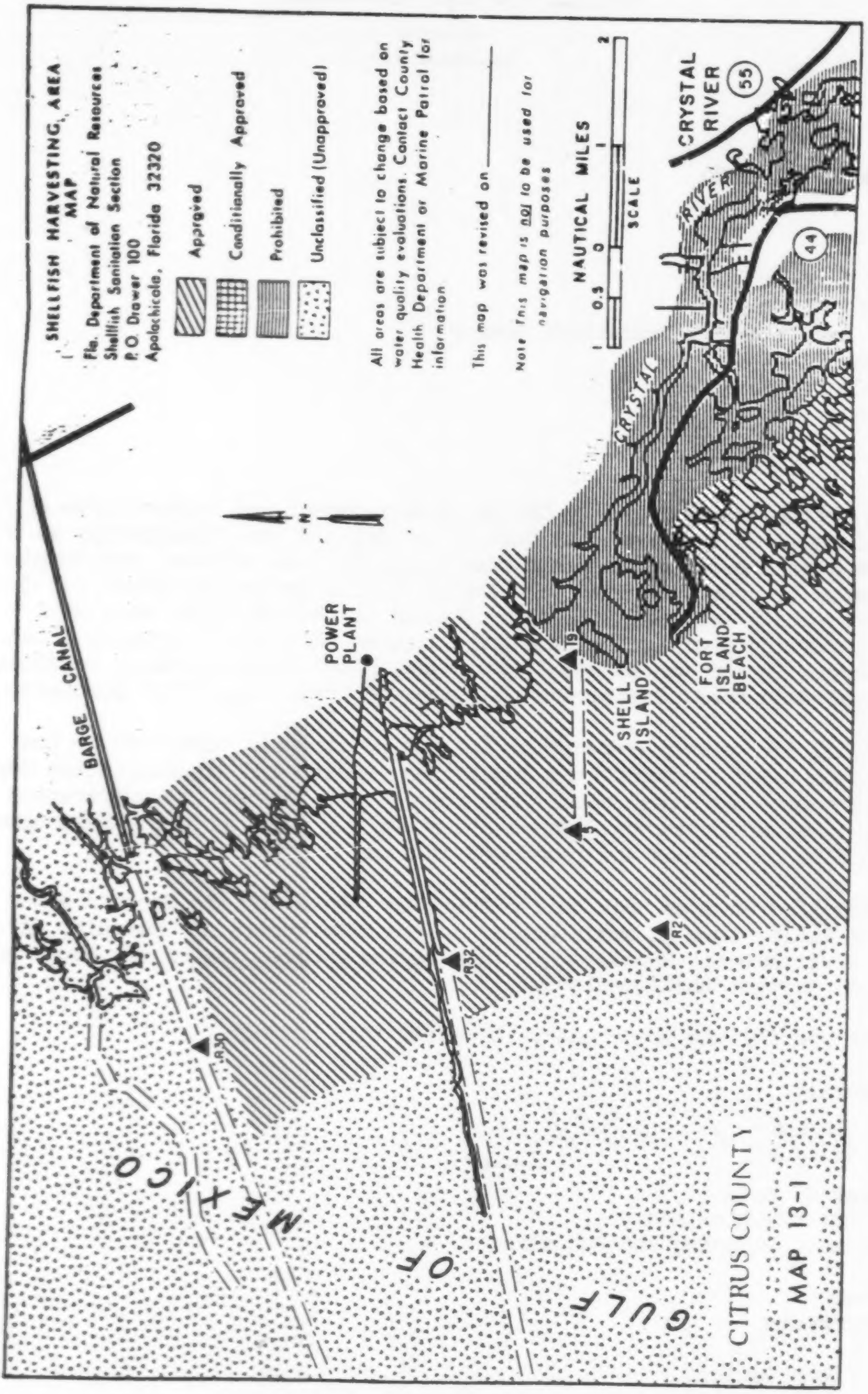
Sincerely,

Roger O. Olmsted

Roger O. Olmsted, M.P.H.
Program Manager
Shellfish Safety Program

Enclosure (1)

ccw/encl: Ms. Karen A. Steidinger, Ph.D., Chief, Bureau of Marine Science & Technology, FL Dept. of Natural Resources
George Morrison, Shellfish Sanitation Branch (HFF-217)
Robert Tucker, State Program Coord. Branch (HFO-320)
Douglas Tolen, Compliance Program Br. (HFF-323)
Adam Trujillo, DD, ORL (HFR-4300)


SHELLFISH HARVESTING AREA MAP
Fla. Department of Natural Resources
Shellfish Sanitation Section
P.O. Drawer 100
Apalachicola, Florida 32320
Approved
Conditionally Approved
Prohibited
Unclassified (Unapproved)
All areas are subject to change based on water quality evaluations. Contact County Health Department or Marine Patrol for information
This map was revised on
Note This map is not to be used for navigation purposes
NAUTICAL MILES
1 0.5 0 1 2
SCALE
N
BARGE CANAL
POWER PLANT
SHELL ISLAND
FORT ISLAND BEACH
CRYSTAL RIVER
CRYSTAL RIVER
55
44
19
R32
R30
R2
GULF OF MEXICO
CITRUS COUNTY
MAP 13-1

STATE OF FLORIDA

Office of the Governor

THE CAPITOL
TALLAHASSEE 32301

BOB GRAHAM
GOVERNOR

November 13, 1980

John E. Hagen, III
Chief, EIS Branch
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Hagen:

This Office, as required by Office of Management and Budget Circular A-95 and Council of Environmental Quality guidelines, and functioning as the State planning and development clearinghouse, has reviewed and coordinated a review of your agency's Draft Environmental Impact Statement for Crystal River Units 4 & 5, SAI 81-0449E. Copies of this document were sent to the Departments of Agriculture and Consumer Services, Community Affairs, Commerce, Environmental Regulation, Health and Rehabilitative Services, Natural Resources, State, and the Game and Fresh Water Fish Commission.

OG-1 Attached for your consideration are review comments submitted by the Departments of Environmental Regulation, Health and Rehabilitative Services, and the Game and Fresh Water Fish Commission. During the preparation of your final environmental impact statement for this project, these comments should be considered and responded to accordingly.

We are also advised that this project is subject to the State's Power Plant Siting laws as administered by the Departments of Community Affairs and Environmental Regulation. This review process has or may cause additional project modifications.

Thank you for the opportunity to review this project.

Sincerely,

Walter O. Kolb /mew

Walter O. Kolb
Sr. Governmental Analyst
Office of Planning and Budgeting

WK/mew
Attachments

cc: John Outland
H. E. Wallace
James L. Keys, Jr.

An Affirmative Action/Equal Opportunity Employer

FLORIDA GAME AND FRESH WATER FISH COMMISSION

CECIL C. BAILEY
Chairman, Jacksonville

THOMAS L. HIRES SR.
Vice Chairman, Tampa

DONALD G. RHODES D.D.S.
West Eau Gallie

R. BERNARD PARRISH JR.
Tallahassee

C. TOM RAINEY D.V.M.
Miami

ROBERT M. BRANTLY, Executive Director
H.E. WALLACE, Assistant Executive Director

FARRIS BRYANT BUILDING
620 South Meridian Street
Tallahassee, Florida 32301

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NOV 6 1980
Natural Resources and Public
Safety Unit
Office of the Governor

'S OFFICE
Budgeting
Coord.
NOV 5 1980
RECEIVED

October 29, 1980

Mr. Ron Fahs, Director of
Intergovernmental Coordination
State Planning and Development
Clearinghouse
Office of Planning and Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, FL 32301

Re: SAI 81-0449E, DEIS, Florida
Power Corporation, Crystal River
Units 4 and 5

Dear Mr. Fahs:

The Office of Environmental Services of the Florida Game and Fresh Water Fish Commission has reviewed the referenced document with regard to fish and wildlife resources.

We feel the proposed cooling water intake location and design represent the best available technology to minimize impingement and entrainment of marine organisms. This will somewhat reduce the otherwise substantial environmental impact associated with power plants. Wastewater from these units will not be discharged into surface waters but will be treated and retained on site. **FGFC-1**

Emissions from the chimneys and the cooling towers will definitely impact the surrounding flora and fauna, although the degree of impact is difficult to determine at this point. The salt drift monitoring program should pay particular attention to the effect of increasing salt loading on the sensitive species and natural vegetation of the area. **FGFC-2**

The groundwater monitoring program proposal appears adequate to detect contamination. There is no mention of contingency plans which would be implemented if excesses are found, however. The close proximity of the plant to the estuary and to the Floridan Aquifer make such plans imperative, and a discussion of these should be included in the final EIS. **FGFC-3**

We appreciate the opportunity to review this draft document. Please call if we may be of further assistance.

Sincerely,

H E Wallace

H. E. Wallace
Assistant Executive Director

2264dr/5/24-25

STATE OF FLORIDA

DEPARTMENT OF
Health & Rehabilitative Services

Bob Graham, Governor

1317 WINEWOOD BOULEVARD
TALLAHASSEE, FLORIDA 32301

October 14, 1980

RECEIVED
OCT 14 1980
Natural Resources and Public
Safety Policy Unit
Office of the Governor

Mr. Walter O. Kolb
Resource Management Clearinghouse Coordinator
State Planning and Development Clearinghouse
Office of Planning and Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32301

Subject: DEIS - Florida Power Corporation
Crystal River Units 4 and 5
(SAI - 81 - 0449E)

Dear Mr. Kolb:

The above Environmental Impact Statement was reviewed and we have no adverse comments on the proposed project. HRS-1

Sincerely,

James L. Keys Jr.

James L. Keys, Jr., R.S.
Environmental Health Consultant
Environmental Health Program

JLK/lg

cc: Mr. Harold Davidson (PDHS)

Citrus County Civic Assn.

P.O. BOX 1006

HOMOSASSA SPRINGS, FLORIDA 32647

November 5, 1980

Mr. Earling Hanson
Environmental Regulation Agency
345 Courtland, N.E.
Atlanta, Ga 30365

Dear Mr. Hanson,

There appeared recently in the St. Petersburg Times an account of a request made by Florida Power Corporation for a permit to draw 800,000 gallons of fresh water from Citrus County wells for cooling in Plants 4 and 5 under construction, or to be constructed, and a statement that the flyash produced by these plants would be contained on 95 acres owned by Florida Power in that vicinity.

CCC-1 We, the Citrus County Civic Association, a large group of concerned citizens would like to support your agency in your efforts to do what is best for this area. Our greatest worry is that such a great amount of water drawn down each day will result in greater salt intrusion. We already experience that in Homosassa, and it is a terrible consequence. May we suggest that you explore all available resources for water - one, we suggest, is the Withlacoochee River.

CCC-2 We are pleased to note flyash produced by these plants will be retained by Florida Power on their property. We suggest that all the flyash produced by Florida Power in this county be held there. At the present time the flyash produced which is not used for concrete products is hauled many miles, through cities on crowded roads to be dumped in what is known as Parsons Pit on Grover Cleveland Boulevard in Homosassa Springs.

Our club is pledged to do our best for the betterment of our community, and we feel our objection to such a drastic draw down of our fresh water is warranted.

We would appreciate your acknowledgment of our letter and assurance that our interests are being protected.

Sincerely,

Nelson Darroch

Nelson Darroch, President

NR/b

WATER ENFORCEMENT BRANCH
RECEIVED
NOV 12 1980
EPA-REGION IV
ATLANTA, GA.

WORKING FOR THE BETTERMENT OF THE COMMUNITY

United States Department of the Interior
FISH AND WILDLIFE SERVICE
15 NORTH LAURA STREET
JACKSONVILLE, FLORIDA 32202

ECOLOGICAL REVIEW BRANCH
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NOV 14 1980
EPA-REGION IV
ATLANTA, GA.

November 12, 1980

Environmental Protection Agency
Enforcement Division
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Attention: Ms Earline Hanson

Dear Sir:

We have reviewed your public notice (No 80 FL 109) regarding the issuance of a National Pollutant Discharge Elimination System permit to the Florida Power Corporation for the proposed Crystal River Power Plant Units 4 and 5 in Citrus County, Florida. Our comments and concerns relating the effects of the discharge and other project elements are contained below. We have also reviewed your draft environmental impact statement for this project. Our comments on the DEIS will be incorporated into the Department of the Interior response which you will be receiving in the near future.

Areas of significant biological productivity and controversy in this vicinity include the seagrass flats and marsh north of the discharge canal. These areas are the chief recipients of the heated effluent. The grasses south of the intake and those contained within the diked intake canal are nursery areas for standing crops of small marine organisms. These organisms are susceptible to being engulfed and swept into the intake. This susceptibility of organisms is manifested in the large impingement and entrainment figures gathered by the operators of the existing plant.

The use of cooling towers which require only make-up water should not add significantly to impingement and entrainment, particularly when the intake for make-up water is located to accept only water that has already passed through the other units. **FWS-1**

There have been repeated adverse fish and wildife effects attributable to excessive turbidity caused by the sloughing off of the intake and discharge dikes as well as construction activities due to maintenance dredging in the intake and/or deposition of spoil. This is particularly true in reference to disposal of fine material in open-water areas.

Unless spoil material is suitably contained and fine material is disposed of on the upland, it is distributed over large areas by the receiving waters. Such material settles out of the water column and smothers benthic organisms. Siltation and turbidity will be further increased due to the construction activities, particularly in reference to the new discharge and intake structures. These activities should be closely monitored. **FWS-2**

FWS-3 In a March 16, 1979, letter to your Regional Administrator, this Service issued a Biological Opinion regarding the potential impacts of this project on the endangered Florida Manatee (Trichechus manatus) and its critical habitat, and the threatened Eastern indigo snake (Drymanchon corasi couperi). That opinion stated that jeopardy to the indigo snake as a result of the project is unlikely, and jeopardy to manatees could be avoided through the regulation of boat speeds, the installation of warning signs, the education of contractor and their employees to the presence of manatees and their protection, and the enforcement of state and federal water quality standards to prevent siltation of manatee feeding areas. A similar Biological Opinion was sent to the Corps of Engineers on February 9, 1979.

The major impacts of Units 4 and 5 are the direct displacement of the land and changing drainage patterns in the vicinity.

FWS-4 The direct removal of 335 acres of vegetation due to facilities, parking, and associated development will adversely affect wildlife species in the area. Major wildlife species will be forced to seek refuge elsewhere. This may not be easily accomplished, since adjacent areas may have already reached their carrying capacity. Indirectly, the facilities will alter drainage patterns of adjacent land areas, divert runoff, change water regimens, and initiate vegetative changes. It would behoove the applicant to assure that water patterns are not drastically altered, and perhaps purposely divert flows in some instances to accomplish some benefit to fish and wildlife resourcs.

FWS-5 Salt drift from the salt water cooling towers spreading across large areas and filtering down through canopies and into terrestrial vegetation could precipitate some long-term environmental changes.

FWS-6 Mitigation measures to compensate for suspected adverse environmental effects due to Units '4" and "5" might focus on the diked wetland area located between the discharge and intake canals. This predominantly Juncus marsh area, which is replenished via an underground river, serves as excellent bird habitat, and benefits small fish, shrimp, and crabs as well. The dumping of large amounts of trash on its eastern end should be stopped and corrected. Installation of culverts or small openings in the western dike will improve the marsh all the way to the eastern end where the trash is now located. Such measures would a long way toward mitigating the adverse ecological impact incurred as a result of construction and operation of Units 4 and 5.

Thank you for the opportunity to comment on this project.

Sincerely yours,

Jerry C. Grover

Jerry C. Grover
Acting Area Manager

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Policy
Washington, D.C. 20230

NOV 14 1980

U. S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Attention: Mr. John E. Hagen III
Chief, EIS Branch

Dear Mr. Hagen:

This is in reference to your environmental impact statement entitled, "Florida Power Corporation, Crystal River Units 4 and 5." (NPDES number FL0036366). The enclosed comment from the National Oceanic and Atmospheric Administration is forwarded for your consideration.

Thank you for giving us an opportunity to provide this comment, which we hope will be of assistance to you. We would appreciate receiving six (6) copies of the final statement.

Sincerely,

Robert T. Miki

Robert T. Miki
Deputy Assistant Secretary for
Regulatory Policy (Acting)

Enclosure: Memo from Mr. Kenneth Hadeen
Center for Environmental
Assessment Services - NOAA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL DATA AND INFORMATION SERVICE
Washington, D.C. 20235

Center for Environmental Assessment Services

October 27, 1980 OA/D242:MR

TO: PP/EC - Joyce Wood

FROM: OA/D2x1 - Kenneth Hadeen

SUBJECT: DEIS 8009.24 - Florida Power Corporation Crystal River Units 4 and 5

General Comments: None.

Specific Comments: Pg. III-13; paragraph 3:

NOAA-1 The DEIS states that "thunderstorms are the most frequent severe storms affecting the site. These storms occur on an average of 80 days per year," and the probability of other forms of severe weather occurring at the site is quite low. The DEIS would be more concise if it stated that thunderstorms are the most frequent storms to affect the site, occurring, on the average, 80 days each year. Occasionally, these storms can develop to severe levels, producing damaging winds, hail, torrential rains, and/or tornadoes.

10TH ANNIVERSARY 1970-1980
National Oceanic and Atmospheric Administration
A young agency with a historic
tradition of service to the Nation

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232

SAJEN-EE

22 October 1980

Mr. John E. Hagan, III
Chief, EIS Branch
Region IV
U.S. Environmental Protection Agency
345 Courtland Street N.E.
Atlanta, Georgia 30365

Dear Mr. Hagan:

We have reviewed the Draft Environmental Impact Statement on Florida Power Corporation Crystal River Units 4 and 5. Our comments follow:

a. Wetland areas affected by the construction of Units 4 and 5, mentioned in the DEIS on page VI-4, are isolated wetlands and meet the criteria for nationwide permits, established under Section 404 of the Clean Water Act. Pending permit number 79Q-1184 for the construction of an intake and outfall structure awaits state approval and EPA-NPDES permits. **COE-1**

b. Reference Technical Support Document, Volume I, page 2-52, second paragraph. The average Lake Rousseau pool elevation is 27.5 feet m.s.l. rather than 27 feet m.s.l. **COE-2**

c. Reference Technical Support Document, Volume II, page 8-11, Alternative Energy Sources. There is hydroelectric power potential nearby at Lake Rousseau. However, the potential capacity is only several megawatts. **COE-3**

Sincerely,

J. A. Barbot, Jr.
For JAMES L. GARLAND
Chief, Engineering Division

CF: HQDA (DAEN-CWP-P)
WASH DC 20314

SAD

RESPONSES TO WRITTEN COMMENTS

RESPONSE DER-1

The modifications to the Conditions of Certification made on May 22, 1980, were inadvertently omitted from the DEIS. They have been included as part of the Florida DER comment letter (pages 4-8 through 4-18). These modifications, which pertain to groundwater withdrawal, are acknowledged by EPA to correspond to recent data obtained from aquifer testing and final wellfield design. Water withdrawal impacts affected by these modifications will meet the requirements of the Southwest Florida Water Management District.

RESPONSE DER-2

EPA acknowledges the prerogative of the state to establish requirements more stringent than those made by EPA. Refer to Comment FPC-1 (page 4-34), which pertains to a discussion of chlorination.

RESPONSE AF-1

Comment acknowledged.

RESPONSE SCS-1

Comment acknowledged.

RESPONSE FS-1

The Crystal River 4 and 5 site was located to mitigate impacts to the coastal hydric hammock (refer to Page VII-2 of DEIS). It is presently planned that the coastal hydric hammock, which is located west of the site, will be left in its natural state. Florida Power Corporation considers this approach to be preferred over silvicultural management.

RESPONSE FS-2

The facilities associated with Crystal River 4 and 5 will comply with the Resource Conservation and Recovery Act (PL 94-580). A potential source, neutralization precipitate (refer to Page V-22 of DEIS), will be required to be analyzed for hazardous materials prior to disposal to the Plant Drains Collection Pond. If it is determined that this material is hazardous, it will be disposed of in an approved hazardous waste landfill.

RESPONSE HUD-1

Measurements of the acidity of precipitation reveal that in parts of the eastern United States, particularly the northeast, and in western Europe, the acidity has increased in the last several decades to a dilute solution of sulfuric and nitric acids (Likens, et al., 1979; JAPCA, 1980). Research performed at the University of Florida showed that the acidity of precipitation found in Florida has also increased. Analyses indicate that sulfuric and nitric acids account for nearly all the acidity in Florida. The component of sulfuric acid is 2.0 to 2.5 times the nitric acid rain portion (Brezonik, 1980). Because of the complexity of acid rain formation and transport, it is not known how individual sources such as Crystal River Units 4 and 5 might influence acid precipitation (JAPCA, 1980). However, as indicated in the DEIS, sulfur dioxide limitations were placed on Crystal River Units 1 and 2 due to the impacts of Crystal River Units 4 and 5 on the Class I area (Chassahowitzka National Wilderness Area). This strategy will limit the total emission of sulfur dioxide from the plant complex to an emission level less than if Units 4 and 5 were not constructed. The annual estimated sulfur dioxide emissions are:

Crystal River Units 1 and 2	174,000 tons/year
Crystal River Units 1, 2, 4, and 5	114,000 tons/year
Emissions Decrease	60,000 tons/year

While there will be an approximate increase in nitrogen oxide emissions (also a precursor to acid rain) of 34,000 tons/year, the decrease in sulfur dioxide emissions will probably more than offset this increase.

RESPONSE HUD-2

In order to focus on the issues pertaining to the construction and operation of Crystal River Units 4 and 5, the socioeconomic aspects were discussed in limited scope in the DEIS (refer to Page VI-6 of the DEIS).

Volume II of the Technical Support Documents (TSD) to the DEIS contained a complete analysis of the economic and social effects of Crystal River Units 4 and 5 (refer to Chapter 7 of TSD). A discussion on construction labor force makeup and housing can be found on Pages 7-21 and 7-22. Other construction and operational socioeconomic impacts can also be found in this chapter.

RESPONSE HLS-1

The ash disposal design presented in the DEIS and Technical Support Documents specifies a total development of approximately 38 hectares (95 acres) at a total height of 12 meters (40 feet). This area is solely dedicated for disposal of fly ash from Units 4 and 5. Based upon this design, there is sufficient capacity to accommodate a quantity of ash equivalent to 24 years of operation for Units 4 and 5. Fly ash, which should not be confused with boiler bottom ash, coal pulverizer rejects, and economizer ash, can be a useful product used in construction. Specifically, fly ash is useful in the construction trades as: an additive in cement and concrete, a mineral filler in asphalt paving, and/or a lightweight aggregate. To use fly ash in this way, it must be handled dry. If 26.5 percent of the fly ash is sold for these purposes, the design would allow on-site disposal of all solid wastes for 30 years.

It is not the intent of the DEIS and NPDES special conditions to allow for indiscriminate disposal of Units 4 and 5 fly ash as fill material. Both EPA and Florida DER require, through operational conditions, that Florida Power obtain prior approval for disposal of fly ash in any method other than that previously approved. These requirements include prior approval for disposal of fly ash off-site. Alternate disposal will require Florida Power to meet the same criteria, i.e., compliance with State of Florida water quality standards, as the approved method. In addition, disposal of fly ash in a way that would circumvent the conditions established by the NPDES Permit and Site Certification conditions, as well as rules and regulations established by EPA and the

State, would be considered a violation and would be appropriately enforced. (Refer to Part III Conditions H and I of the NPDES permit and Site Certification Conditions III.H.3.)

Florida Power Corporation is presently studying disposal alternatives for ash from Units 1 and 2. Ash from these units is not approved for disposal in the area designated for Units 4 and 5. Chapters 17-7 (Solid Waste Disposal) and 17-2 (Water Pollution), Florida Administrative Code, are the regulatory requirements presently applicable to Crystal River Units 1 and 2 fly ash disposal.

RESPONSE HLS-2

The potential impacts of salt drift from Crystal River Units 4 and 5 are of considerable concern to both the environment and structures associated with the units. As a consequence, the cooling towers will be designed for a maximum drift rate not to exceed 0.0005 percent of the circulating water rate. This level of control will assure that, under normal and peak load conditions, drift will not exceed 8 gpm and 13 gpm, respectively. Natural draft cooling towers presently operating have drift rates lower than guaranteed, and equivalent to 0.0005 percent of circulating water rate.

Salt drift deposition has been analyzed using computer models. The maximum salt drift is expected to be 10.6 kilograms per hectare per month (114 pounds per acre per year) at a location 0.3 kilometers (0.2 miles) west of the cooling towers. This concentration is approximately 47 percent lower than that concentration known to cause vegetative injury in a species highly sensitive to salt drift. At a distance less than 2 kilometers (1.2 miles), salt drift is estimated to be 1.3 kilograms per hectare per month (14.1 pounds per acre per year), or 12 percent of the maximum impact. At a distance of over 11 kilometers (7 miles), it is not expected that salt drift would be measurable over a background. The background level at the coast is expected to be 2.6 kilograms per hectare per month (28.6 pounds per acre per year).

EPA and Florida DER recognize the uncertainties associated with computer modeling of a complex phenomenon such as salt drift deposition. To ensure no adverse impacts, a salt drift monitoring program is required. Refer to Chapter 3.0 of this FEIS for further discussion of salt drift monitoring.

RESPONSE HLS-3

The Technical Support Documents to the DEIS were written prior to promulgation of revisions to New Source Performance Standards (NSPS) for steam electric plants. These standards require new facilities to utilize sulfur dioxide removal from 70 to 90 percent. Prior to these NSPS revisions, only an emission limit was established. This limit could be met through the use of low-sulfur (compliance) coal. Crystal River Units 4 and 5 were approved under the older NSPS allowing for meeting emission limitation standards through the sole use of low-sulfur (compliance) coal. The revised NSPS removes the advantage of using low-sulfur coal in other plants constructed after Crystal River Units 4 and 5 since SO_2 removal equipment is required. Low-sulfur coal is thus more available for the Crystal River units. If low-sulfur (compliance) coal cannot be obtained, conditions of Florida's Site Certification Conditions and EPA's Prevention of Significant Deterioration (PSD) permit (refer to DEIS Appendices D and E, respectively) require flue gas desulfurization equipment if SO_2 emission standards cannot be met. If scrubbers are needed, FPC will have to provide for approved sludge disposal and analyze any changes in air quality.

Florida Power has contracted for 2 million tons of low-sulfur coal per year for 20 years. This quantity will meet approximately 50 percent of low-sulfur coal needs for 20 years. Further long-term contracts for low-sulfur coal are being sought.

RESPONSE HLS-4

See Response HUD-1 (page 4-61).

RESPONSE DI-1

On May 22, 1980, EPA proposed regulations which would require states to develop and implement programs to protect visibility in federal Class I areas. These proposed regulations reference several documents which evaluate the sources, causes, and potential remedies to visibility impairment. However, modeling techniques to predict the potential impact of individual sources are still in the development stages and cannot be used at this time as reliable predictors of actual impacts. As a result, no quantitative analysis of the potential impacts upon visibility at Crystal River Units 4 and 5 can be made.

The impact on visibility to the Florida National Scenic Trail is, however, not expected to be significant. The distance (greater than 35 kilometers) and direction (wind frequency of 8.5 percent from the northwest sector) of Crystal River Units 4 and 5 to that portion of the Florida Trail is such that visibility impacts are not expected to be significant.

RESPONSE CDC-1

Impacts associated with open burning of land-clearing waste will be of short duration and will comply with regulations promulgated by the State of Florida (Chapter 17-2.04(3) F.A.C. and Chapter 51-2 F.A.C.). These regulations are administered by the Division of Forestry to ensure that conditions during burning will not cause significant air quality impacts.

Solid waste materials from construction will be recycled or landfilled in state-approved areas. Open burning of waste construction materials will not occur.

RESPONSE CDC-2

The monitoring program is designed to ensure that Florida's groundwater quality standards are not exceeded by leachate from the ash and coal areas. Lining of the coal storage areas is required if the pyritic sulfur content of the coal exceeds 0.2 percent. Also, the final cover of each ash disposal cell will be at least 12 inches of clay liner (or an equivalent) placed on top and on the exposed sides. Sufficient topsoil to support vegetation will be placed over the liner. This design will limit rainfall leaching through the pile. The groundwater monitoring program is designed to evaluate potential impacts as a result of this solid waste disposal design. Refer to Chapter 3.0 of this FEIS.

RESPONSE NRC-1

Florida Power is required to conduct a leachate monitoring and testing program which will determine the long-term ash disposal landfill design details that are necessary to protect groundwater and surface water quality (refer to Site Certification Conditions, Attachment 2). These studies, which are presently in progress, are discussed in Section 6.2.3 of the Technical Support Documents. In addition, Florida Department of Environmental Regulation (FDER) Special Conditions of Certification require the utility to monitor the groundwater in the vicinity of the operating landfill. If groundwater quality standards are violated, the landfill must be sealed, relocated, or closed, or the operation of the facility must be altered to prevent significant contamination of the groundwater. Radioactive components of potential leachate from the ash disposal landfill are being studied as part of the monitoring studies.

RESPONSE NRC-2

The air quality impact of Crystal River Units 4 and 5 was analyzed in detail during issuance of the Prevention of Significant Deterioration (PSD) approval. EPA determined that the proposed emissions from the facility will achieve Best Available Control Technology (BACT) for all pollutants that would be emitted in quantities greater than 100 tons per year. In addition, EPA has determined that the facility will not exceed an air quality impact greater than the Class I and Class II PSD increments for particulate matter and sulfur dioxide. The maximum impacts will be 60 percent of the Ambient Air Quality Standards (AAQS) to protect human welfare and 30 percent of the AAQS to protect human health. These maximum concentrations will occur close to Crystal River Units 4 and 5, and will not be exceeded more than once per year.

RESPONSE NRC-3

EPA does not believe it appropriate to address the environmental implications of the coal-fuel cycle within the scope of the Crystal River Units 4 and 5 EIS. The Council on Environmental Quality's (CEQ) regulations for implementing NEPA (40 CFR §1500-1508) direct that EISs shall be concise and shall be no longer than necessary for compliance with NEPA. CEQ directs that impacts shall be discussed in proportion to their significance, with only brief discussions of less significant issues. In addition, the CEQ regulations allow for incorporation, by reference, of reasonably available information.

The options available to FPC for obtaining coal to fuel Units 4 and 5 preclude a meaningful analysis of the specific coal source FPC may ultimately secure. Numerous studies devoted to the environmental implications of aspects of the coal-fuel cycle have been reported and documented.

RESPONSE NRC-4

An aquatic ecology program has been proposed for Units 1, 2, and 3. The results of this program may indicate that procedural modifications to Units 1, 2, and 3 are necessary. The Draft EIS does address, in detail, alternative makeup cooling water sources for Units 4 and 5, as well as heat dissipation strategies.

Florida Power will be constrained to operate Units 4 and 5 in compliance with state and federal permits in force at the time, regardless of future determinations concerning Units 1, 2, and 3 at Crystal River. Any permit modifications based upon changes in the present supply or additional supplies of makeup water would require agency scrutiny to determine whether the environmental effects are minimized.

RESPONSE NRC-5

Increased coal delivery by rail is expected to offset the need for increased barging of coal for the Crystal River complex under present coal delivery agreements. Also, please refer to comments by the Florida Game and Freshwater Fish Commission and the U.S. Fish and Wildlife Service (pages 4-51 and 4-55, 56, respectively).

RESPONSE NRC-6

See Response FPC-1 (page 4-69).

RESPONSE NRC-7

Florida Power Corporation presently is proceeding toward a design modification to install ammonia and chlorine detection equipment for the control room (Unit 3) which will initiate the isolation of outside air intake and switch over to internal recirculation.

RESPONSE NRC-8

The potential meteorological influence on Unit 3 of structures associated with Units 4 and 5 will be atmospheric dispersion. Atmospheric dispersion can be affected by turbulence caused by disrupted air flow in the immediate vicinity of the structure. The most significant disturbed flow will occur five building heights (or widths, whichever is smaller) downwind of a structure. Both distance and direction are necessary for turbulent effects to occur.

Florida Power Corporation's Crystal River Units 4 and 5 are located approximately 915 meters north of Unit 3. The largest structure associated with Units 4 and 5 will be the cooling towers. Each tower will be 134 meters in height and 113 meters in diameter at the base. The closest tower is located 914 meters from Unit 3 in a direction 10° west of due north (compass reading 350°). The steam generator building, the second-largest structure, is 80 meters in height and is located 1,005 meters due north of Unit 3. Although the steam generator stacks will be 183 meters in height, their small width will not cause significant turbulence.

The major area of turbulent wake influence at Crystal River Units 4 and 5 structures will extend no greater than 670 and 400 meters, respectively, from the cooling towers and steam generator buildings. Unit 3 does not lie within this zone of turbulent wake influence. In addition, the frequency of wind from the direction that would cause turbulent interaction is relatively infrequent. Interaction with Unit 3 has the potential to occur less than 6 and less than 10 days per year, respectively, for the cooling tower and the steam generator building. As a consequence, the structures associated with Units 4 and 5 are not expected to influence the dispersion of accidental releases of airborne radioactivity at Unit 3.

RESPONSE FPC-1

A limit of 0.01 mg/l of total residual oxidants (TRO)* has been included in the Draft Permit at the Units 4 and 5 point of discharge (POD) to the site discharge canal with the provision that nondetection by approved analysis technique shall be deemed compliance. *[Total residual oxidants is the appropriate term (rather than total residual chlorine) in salt water where other oxidants (bromine, iodine, etc.) are produced by the addition of free available chlorine.]

A specification has been included that the continuous monitor used must have a limit of detection of not more than 0.05 mg/l. However, during periods of manual monitoring, the limit of detection of the manual monitor will determine the limit of detection (±0.03 mg/l), and during periods of continuous monitoring the limit of detectability of the installed monitor will determine the limit of detection (not greater than 0.05 mg/l). A requirement for once-per-week multiple grabs is included in the Draft Permit.

EPA agrees that installation and proper operation of a dechlorination facility using sulfur dioxide should allow the applicant to comply with effluent limitations and Water Quality Standards requirements relative to TRO at the POD from the Units 4 and 5 blowdown canal to the site discharge canal. EPA further realizes that chlorine addition may not be required or that discharge concentrations of TRO may be sufficiently low during portions of the year to preclude the necessity of operating the sulfur dioxide system. So long as effluent limitations are met during such situations, sulfur dioxide addition is not required by the Draft Permit. Additionally, since compliance will be achieved at the POD, a mixing zone for TRO is not applicable and "chlorine" has been removed from Part III.E of the Draft Permit. Modeling and dye dispersion testing as required in the Draft EIS is no longer necessary since Water Quality Standards limitations will be met at the POD.

RESPONSE FPC-1a

EPA concurs with the approach proposed by the applicant. Conditions and monitoring requirements have been appropriately changed for Serial Number 013 and Part III.E in the Draft Permit.

RESPONSE FPC-2

EPA agrees that frequent testing of drift elimination performance of the cooling towers would be unnecessary given periodic inspection of the drift eliminators. Quarterly inspections of the drift eliminators would reveal problems that may be developing. Subsequent NPDES permits would allow for future testing of the drift eliminators to ensure a maximum drift rate of 0.0005 percent of the circulating water rate.

RESPONSE FPC-3

The language of the permit condition has been revised to clarify the intent of this condition.

RESPONSE FPC-4

Since coordination with EPA and the State is necessary should significant contamination of the ground water be noted, immediate consultation with EPA and the State is essential. The language of the permit condition has been clarified.

RESPONSE FPC-5

No requirement was intended for the plant drains collection pond since no overflow point is planned. Part III.G has been clarified.

RESPONSE FPC-6

It is not appropriate to change wording in the DEIS. Nevertheless, the comments reflect Florida Power's decision to enclose conveyors and use air pollution control (baghouse) equipment for control of particulate emissions from coal handling. Plant operations must meet conditions established in the PSD Approval and Site Certification (refer to Appendices D and E, respectively).

RESPONSE FPC-7

The statement presented in the summary sheet for the DEIS concerning acid rain is appropriate. See also Response HUD-1 (page 4-61).

RESPONSE FPC-8

With reference to the plant elevation datum (PED), mean sea level is approximately 27 meters (89 feet). The mean annual flood is therefore approximately 27.5 meters (90 feet) PED, and the 100-year flood elevation is approximately 30.5 meters (100 feet) PSD.

RESPONSE FPC-9

EPA acknowledges Florida Power's decision to use five pumps for plant service water makeup. As a result, groundwater withdrawal impacts will be equal to or less than those presented in the DEIS and Technical Support Documents.

RESPONSE FPC-10

EPA and FPC have agreed that the following description of makeup and blowdown systems is appropriate.

Normal operation of the makeup and blowdown system will consist of continuous operation of one intake pump and one makeup pump for each unit in operation. The system design is based on a constant rate of makeup concept, but the intake pumps' discharge rate will vary with the water level (tide) in the existing cooling water discharge canal. When the tide elevation equals or exceeds 92.0 ft PED, the cooling tower makeup water intake channel will overflow to the cooling tower blowdown discharge canal. At high tide, with both units operating, the overflow will not exceed 1,500 gpm.

RESPONSE FPC-11

See Response FPC-1 (page 4-69).

RESPONSE FPC-12

See Response FPC-6 (page 4-71).

RESPONSE FPC-13

Since sulfuric acid will be added to control scale in the cooling system, there is the potential for ecological impact. The alkaline nature of sea water will, as the comment noted, neutralize sulfuric acid so that no free acid is present. Nonetheless, the potential for ecological impacts still exists.

RESPONSE FPC-14

See Response FPC-10 (page 4-72).

RESPONSE FPC-15

See Response FPC-10 (page 4-72).

RESPONSE FPC-16

See Response FPC-1 (page 4-69).

RESPONSE FPC-17

See Response FPC-1 (page 4-69).

RESPONSE FPC-18

Water loss from dewatering bins in Table 5.2-1 is included as "Exfiltration" under the subheading "Losses."

RESPONSE FPC-19

The lowest flow considered in the six scenarios evaluated in Section 5.2.2, Cooling System Blowdown (Volume I, Technical Support Documents) was 170,500 gpm. This corresponded to a condition occurring early in the 21st century when Units 1 and 2 have been decommissioned and Unit 3 is in temporary shutdown. The figure mentioned in the comment was derived by adding flows passing through Units 1, 2, and 3 when the units are temporarily shut down. These figures as provided by Florida Power are 77,500 gpm, 82,500 gpm, and 170,500 gpm for Units 1, 2, and 3, respectively.

RESPONSE FPC-20

See Response FPC-10 (page 4-72).

RESPONSE FPC-21

See Response FPC-9 (page 4-71).

RESPONSE FPC-22

Refer to Chapter 3 (Monitoring Programs).

RESPONSE FPC-23

See Response FPC-1 (page 4-69).

RESPONSE FDA-1

The extent of Class II waters in Citrus County is located south of the Crystal River Units 4 and 5 plant site from approximately the Crystal River to the Hernando County line. The waters adjacent to the discharges for Units 4 and 5 are designated as Class III (refer to Chapter 17-3.161 FAC). Florida Power Corporation is required to meet the surface water quality standards for Class III waters.

RESPONSE FDA-2

The sewage treatment plant is designed to assure no discharge. Florida Power Corporation has neither applied for nor received approval to discharge from the sewage treatment plant to waters of the United States.

RESPONSE OG-1

The comment is acknowledged. Comments attached to this letter from the Office of the Governor are addressed elsewhere in the section under the appropriate agency heading.

RESPONSE FGFC-1

Comment acknowledged.

RESPONSE FGFC-2

The air quality impacts associated with the Florida Power Crystal River plant complex will meet all Ambient Air Quality Standards (AAQS) promulgated to protect human health and welfare. AAQS designated to protect human welfare included consideration for impacts to flora and fauna when they were promulgated. Refer to Response NRC-2 (page 4-66) for more discussion on air quality impacts.

A discussion of the salt drift monitoring program is included in Chapter 3.

RESPONSE FGFC-3

Chapter 3 contains a discussion of the groundwater monitoring program. Special Condition XIIA of the Florida Site Certification and Part III.K of the NPDES permit require Florida Power to consult with EPA and the State of Florida and to implement corrective measures if significant contamination by leachate occurs. These measures may include but not be limited to: sealing, relocating, or altering operations of the ash disposal area, plant drains collection pond, and/or coal piles.

RESPONSE HRS-1

Comment acknowledged.

RESPONSE CCC-1

An analysis of water withdrawal was presented in the Technical Support Documents to the DEIS (see Volume I, page 5-53). As discussed in this section, the amount of withdrawal is estimated to be less than 1 percent of the estimated groundwater flow between the Crystal and Withlacoochee Rivers. The estimated quantity of groundwater volume flowing toward the coast between the Crystal River and Withlacoochee River (approximately 250 million gallons per day) will inhibit potential saltwater intrusion caused by the water withdrawal from Units 4 and 5.

It should be emphasized that fresh water is used only for plant services such as boiler makeup. Salt water is used for condenser cooling.

RESPONSE CCC-2

See Response HLS-1 (page 4-62).

RESPONSE FWS-1

Comment acknowledged.

RESPONSE FWS-2

Special Condition XI of Florida's Site Certification Approval requires sheet piles or turbidity screens to be used as necessary to prevent turbidity in excess of 50 JTU above background 150 meters from the construction site. This condition applies to the construction of the cooling water makeup and discharge structures. Florida Power has submitted a permit application for these structures to the Corps of Engineers for this approval. No other structures or activities located in waters of the United States are associated with Crystal River Units 4 and 5.

RESPONSE FWS-3

Comment acknowledged. The Biological Opinion of the U.S. Fish and Wildlife Service was published in the DEIS.

RESPONSE FWS-4

During ecological and hydrological surveys of the Crystal River Units 4 and 5 site, no major surface water flows were noted. It is probable that the coastal hydric hammock located west of the site receives a majority of fresh water from the groundwater aquifer. At this location, the aquifer interfaces with the salt water, causing an upwelling of fresh water. As a consequence, surface drainage is not believed to play a major role. See also Groundwater Monitoring Program contained in Chapter 3. Florida Power was constrained by existing environmental regulations to design facilities to handle stormwater runoff. In addition, the plant foundation rests upon drilled piers rather than grouting. This design should produce less interference with groundwater movements.

RESPONSE FWS-5

See Response HLS-2 (page 4-63) and the Salt Drift Monitoring Program contained in Chapter 3.

RESPONSE FWS-6

Comment acknowledged.

RESPONSE NOAA-1

Comment acknowledged.

RESPONSE COE-1

EPA acknowledges that Section 404 permit requirements have been fulfilled by Florida Power for the isolated wetland areas. The pending permit for construction of intake and outfall structures is awaiting completion of the NPDES permit process represented by this FEIS.

RESPONSE COE-2

Comment acknowledged.

RESPONSE COE-3

Lake Rousseau was constructed in 1909 and used by Florida Power Corporation for hydroelectric generation. This station was retired when the Inglis plant was constructed. The capacity of this station was significantly less than 1 megawatt. This capacity was not enough to consider it further with analysis of alternative energy sources.

REFERENCES

Air Pollution Control Association Presentation. 1980. Acid Rain: An International Concern. Journal of the Air Pollution Control Association, 30(10):1089. October.

Brezonik, P.L., Hendry, C.D., Edgerton, E.S., Schutze, R.L., and Chrisman, T.L. 1980. Acidity, Nutrients, and Minerals in Atmospheric Precipitation over Florida: Deposition Patterns, Mechanisms, and Ecological Effects. Completion Report to U.S. EPA for Contract #R-805560 (in preparation).

Likens, G.E., Wright, R., Galloway, J., and Butler, T. 1979. Acid Rain. Scientific American, Volume 24, Number 4. October.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
and
FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

A PUBLIC HEARING IN RE:)
)
Application of FLORIDA POWER CORPORATION)
)
Crystal River Steam Electric Power)
Generating Plants, Units 4 and 5)
)

TIME: 7:30 p.m.

DATE: October 28, 1980

LOCATION: 121 NW Highway 19
Crystal River, Florida

Reporting: Anne Japour

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PROCEEDINGS

(Whereupon, at 7:30 p.m. the public hearing was called to order)

MR. ZELLER:

I think it's 7:30, and I'd like to get started with the hearing. I'll make a few comments before we under way.

First of all, let me thank all of you that are here for showing up on a rainy night, and especially with all of the big action that's on television tonight. Please understand we didn't schedule the hearing after the debate. They scheduled the debate after we scheduled the hearing, so we didn't have anything to do with that.

The Federal Statutes have different requirements for new sources of potential pollutants compared to existing sources, and the hearing tonight is going to deal with a new source of potential pollution to the environment, and of course it involves a power plant that's subject to several requirements under the law; one of these under the Environmental Policy Act, NEPA, that says that there should be an EIS.

Under the Clean Water Act, it calls for a water permit to discharge pollutants. Under the Clean Air Act, there's a requirement for clean air and the prevention of significant deterioration, and there also must be a certification of the permit by the State of Florida where it's being issued.

So the hearing tonight will essentially cover all of those areas. It's a combination of a number of things that are going to be involved with a new source.

It'll be an informational-type hearing. Nobody will be sworn in, and there'll be no cross-examination or things like that.

The purpose of the hearing is to provide information to anyone who may be interested in the permit for the new power -- for the new units at the Crystal River Power Plant, and I think the company is represented here and would be able to respond to any questions you might have, and I would be glad to respond to any questions that you might have relative to any federal actions that would take place.

So with that little preliminary, let me go to my opening statement, which is something I need to read into the record so we can get under way, and then a few other people will make some comments.

First of all, my name is Howard Zeller, and I'm the Deputy Director of the Enforcement Division of the United States Environmental Protection Agency in Atlanta, Georgia.

With me tonight are some other people whose name tags you can see. This is Mickey Bryant to my left with the Florida Department of Environmental Regulation; Charles Kaplan to my right; Mr. Dario Dal Santo, who is involved with the Environmental Impact Statement, who's also to my left; and Mr. Wilson is there handling the recording equipment.

FORM HR 125 REPORTERS PAPER & MFG CO 800 626-6313

We're going to be talking tonight about possible actions by EPA with respect to Crystal River Units 4 and 5, which is a new electric generating facility proposed by the Florida Power Corporation.

The National Environmental Policy Act of 1969 requires that federal agencies include in their decision-making process an appropriate and thorough review of the environmental consequences of proposed action.

NEPA also requires an Environmental Impact Statement be prepared on all major federal actions that significantly affect the quality of the human environment.

Issuance of a National Pollutant Discharge Elimination System permit to new source facilities is considered to be a major federal action. That's why we're here tonight, to discuss the EIS.

The EIS has been prepared, and notice of its availability was published in the Federal Register. That was in Volume 45, and the date on that was September 26, 1980.

If any of you did not receive a copy of that and would like to receive a copy, you can take care of those arrangements tonight by talking to any of us here at the table.

Our hearing is for the purpose of receiving comments on this Draft Environmental Impact Statement. It's also for the proposed issuance of a National Pollutant Discharge Elimination System permit, and also, under Section 401 of the

Clean Water Act, the State of Florida has been requested to certify the proposed permit so that it will not cause any violations to Florida Water Cuality Standards.

So those are the three significant actions that this hearing will address tonight.

The Federal Water Pollution Control Act, which is now generally referred to as the Clean Water Act, has an explicit goal for the elimination of the discharge of pollutants by 1985.

To achieve the goal, the Act created the National Pollutant Discharge Elimination System permit, and I'm going to call that NPDES from here on out, to control discharge of pollutants into the nation's waters.

Under this permit program, anyone who has a discharge into waters of the United States must receive a permit, which will set limits and conditions on the discharge of pollutants.

The Act requires strict limits for new sources, such as the Crystal River facility.

The NPDES permit is the basic enforcement tool for water pollution abatement under the federal law. Discharge must be in compliance with this permit's effluent limits upon initiation of its discharge.

Any violation of the terms or limits or violations of the permit will be subject to discharge -- to civil or maybe

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even criminal penalties.

Now, in accordance with this NPDES permit system and Section 306(c) of the Clean Water Act, Florida Power Corporation has applied to the Environmental Protection Agency for a permit to discharge pollutants from Crystal River Units 4 and 5, which is presently under construction here in this county. Discharges from the facility will enter the Gulf of Mexico by the plant discharge canal.

A draft permit proposed for the Crystal River units was prepared by the staff of Region IV, and we referred to the water quality standards, the new source performance standards for the steam electric generating point source category, which is contained in the Federal Regulations, and it also involves the best professional and engineering judgment of the staff concerning the application of these guidelines to site-specific considerations.

Now, we're here tonight to get specific comment on the draft permit and the Draft Environmental Impact Statement.

As we said in the public notice, all pollutant limitations and other permit conditions are tentative, and they're open to comment here tonight. Nothing will be final until this hearing is over, until the final EIS is issued, and the final permit is issued, and an opportunity will be made for anyone who wants to make a comment to do so.

Now, we've made available for distribution copies

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of the public notice, the fact sheet, permit rationale information, and the Draft EIS.

Each one of these documents, as well as other relevant documentation, and all comments received tonight or submitted in writing by November 10th will become a part of the record of this hearing.

The information in the record will be used in assessing the draft permit and then preparing the final Draft NPDES permit proposed for issuance and which will be issued following a release of the final Environmental Impact Statement.

In addition, you should be aware that all public comments on the Crystal River facility and the Draft EIS, whether received here tonight and transcribed for the record or submitted in writing directly to EPA, will be summarized and addressed in the final Environmental Impact Statement.

Now, under the provisions of the Clean Air Act, the Florida Power Corporation submitted a Prevention of Significant Deterioration permit application to EPA in 1977.

Subsequent to review and public notice, Florida Power received a permit to construct this plant in 1978. This, of course, deals with the clean air aspects of the plant. The plant will be a coal-burning facility, and in order -- before construction could begin, a permit, which would show that the quality of the air wculd not be deteriorated, was required.

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This was issued in 1978.

Now, the purpose of the hearing tonight is to address issues relative to the Draft Water Discharge Permit and the Draft Environmental Impact Statement.

The ~~NPDES~~ PSD permit's already been issued, and it's not a matter of any concern to us here tonight at this hearing.

This is an informational hearing, as I told you, and it's conducted pursuant to 40 CFR, and that part of the regulations is 124.42(b).

The notice of the hearing was published in the Suncoast Sentinel on September 24th and in the Tampa Tribune on September 25th, and in addition to that we sent out copies of the public notice and fact sheet to a great many people who are on our mailing list.

Now, that about covers what I wanted to say, and at this time I'd like to ask Mickey Bryant, who is here on my left and with the Florida Department of Environmental Regulation, to see if he has any comments that he wants to make relative to the State's requirement to certify this permit under Section 401 of the Clean Water Act, and if the State does not certify the permit, EPA cannot issue it.

Mr. Bryant, do you have some comments you'd like to make for the record?

MR. BRYANT:

Thank you, Mr. Zeiler.

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I am Mickey Bryant, Administrator of the NPDES section of the Florida Department of Environmental Regulation.

On behalf of Secretary Varn, I would like to welcome everyone to this hearing also.

It's especially nice for me to return to Crystal River tonight, because some of you may know that I'm a former resident of this area, of Citrus County, and a graduate of Crystal River High School.

My statement at tonight's hearing is brief. The Department originally reviewed the proposed installation of Units 4 and 5 at Crystal River pursuant to an application submitted under the Florida Electrical Power Plant Siting Act.

This Act is contained within Chapter 403, Florida Statutes, and addresses the procedures and requirements to be met for establishment of new power plant facilities in Florida.

On November 21st, 1978, the Florida Cabinet approved the site certification of these two power plant units with specific conditions of certification.

I have a copy of this certification with me tonight in case anybody wishes to examine it. There was also a copy in the Draft EIS, which anyone who has a copy of that can examine it there.

Pursuant to federal law, Section 401, which has been mentioned before, the Federal Water Pollution Control Act, as amended by the Clean Water Act, authorizes states to

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review and issue or deny certification for proposed facilities seeking NPDES permits.

The Department is here tonight to announce its intention to issue State certification to Florida Power Corporation for Units 4 and 5 at Crystal River.

The Department plans to certify the two new units contingent upon compliance with the conditions of the site certification adopted by the Florida Cabinet in November of 1978, and later modified on February 22nd, 1980, and May 22nd, 1980.

I believe that the final EIS will contain the --- It contains the first modification and will contain the May 22nd modification when it comes out.

State certification will also require compliance with the terms and limitations contained in the Draft NPDES permit.

I am here tonight to receive public comment, which will be reviewed prior to issuance of State certification by the Department.

Your attendance at tonight's hearing is appreciated, and I look forward to receiving your comments.

MR. ZELLER:

Thank you, Mr. Bryant.

Next I'd like to ask Mr. Dario Dal Santo, who was the Environmental Impact Statement Project Officer, to talk

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a little bit about the NEPA process and about the Environmental Impact Statement that was prepared for Crystal River Units 4 and 5.

Mr. Dal Santo:

MR. DAL SANTO:

Thank you, Mr. Zeller. Good evening.

I am Dario Dal Santo, EPA, Region IV Project Officer for the Environmental Impact Statement on Florida Power Corporation's -- and I'll refer to that as FPC -- proposed Crystal River Units 4 and 5.

The proposed units will have a gross generating capacity of 1390 megawatts and will be located at the existing FPC Crystal River complex in Citrus County, Florida.

Under the National Environmental Policy Act of 1969 -- that is NEPA -- an Environmental Impact Statement must be prepared for all major federal actions which may significantly affect the quality of the human environment.

Operation of the Crystal River Units 4 and 5 facility will require a National Pollutant Discharge Elimination System permit.

The EPA, Region IV, Regional Administrator has determined that the proposed facility is a new source as defined by Section 306 of the Clean Water Act.

Section 511 of the Clean Water Act defines issuance of new source NPDES permits as subject to the provisions of

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NEPA. That is, issuance of the NPDES permit is a major federal action that may significantly affect the quality of the human environment.

Consequently, an EIS has been prepared. The purpose of the EIS is to provide government agencies and the public with information to assure that an appropriate and thorough review of the environmental impacts of the proposed action is included in the decision-making process.

The EIS was prepared using the so-called third-party EIS process. Under this arrangement, the Florida Power Corporation retained a consultant to prepare the EIS with EPA guidance and direction.

Environmental Science and Engineering, Incorporated, of Gainesville, Florida, was nominated by Florida Power Corporation and approved by EPA as a third-party consultant to prepare the EIS.

However, ultimate responsibility for the EIS rests with EPA.

The Draft EIS consists of the summary document, which is usually referred to as the Draft EIS and the two-volume technical support document.

This procedure is consistent with Council of Environmental Quality guidelines on implementing NEPA. The intent of these guidelines is to produce a readable, understandable summary document, which addresses and evaluates

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project alternatives, direct and indirect environmental impacts associated with these alternatives and potential actions which may serve to mitigate these impacts.

The technical support document contains the detailed evaluation of the project alternatives and impacts.

The Draft EIS presents the evaluation of several systems alternatives for the proposed project. Generating system alternatives include management and alternate energy sources.

The proposed coal-fired units were selected as preferable based on environmental considerations, available technology, engineering, licensing, and construction lead times.

Other principal systems of alternatives evaluated include those related to siting, cooling systems and water resources, wastewater treatment, and air emissions control.

The CEQ guidelines -- that is, the Council of Environmental Quality -- guidelines specify that an EIS should focus on the major issues identified in the scoping stage of the environmental review process for a project; that is, in the very initial stages of project identification.

The major issues primarily focus on cooling water sources and systems, wastewater treatment, air emissions control, and endangered species.

The proposed cooling system will utilize natural draft cooling towers in conjunction with make-up water to the

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cooling towers from the existing cooling water discharge canal for Units 1 through 3.

Impacts to the aquatic environment from this system should be minimal since the cooling water for Units 4 and 5 essentially will have been used as cooling water for Units 1 through 3.

Process wastewaters will be routed through a wastewater treatment system to a plant drains collection pond. No discharge of these wastewaters to surface waters of the United States is expected.

A Prevention of Significant Deterioration -- that is, a PSD -- review has been conducted. PSD analysis indicated that air quality changes in the surrounding Class II area and the Class I area 40 miles distant would be within allowable PSD increment levels.

Based on this analysis, state and federal air quality standards will not be violated. Salt drift originating from the cooling towers, however, could impact nearby vegetation.

Barge traffic associated with the transport of coal will traverse waters known to be within the range of the Florida manatee, which is an endangered species. The US Fish and Wildlife Service rendered a biological opinion stating that uncontrolled activities would likely jeopardize the continued existence of the manatee.

To mitigate these programs, or, to mitigate these

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impacts, several programs have been required, and I'll briefly discuss these.

A salt drift monitoring program is required as a condition of the NPDES permit. The program will be initiated prior to commencement of plant operation and will assess the impacts of salt drift.

Should significant impacts be evident, Florida Power Corporation will consult with EPA and the State to address measures to mitigate these impacts.

A groundwater monitoring program is required by the NPDES permit and will assess any impacts of leachates from the coal pile, ash disposal, or effluent disposal areas.

Should significant impacts be identified, mitigative measures including relocation of disposal areas will be evaluated.

To mitigate impacts to the manatee, all vessels associated with the project will operate at no-wake speeds at all times while in shallow waters of channels in the project area.

Additionally, early in the planning stage of the project, the proposed plant location was shifted eastward to avoid major areas of coastal salt marsh, coastal hydric hammock, and hydric hammock.

It should be emphasized the Draft EIS represents EPA's assessment of the project and proposed action. A

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decision on permit issuance will be included in the final EIS.

Any comments you may have on the Draft EIS or the permitting decision would be appreciated. Comments should be forwarded to Mr. John E. Hagan of EPA, Region IV, and the address is located, or, the address is at the bottom of the agenda.

The comment period on the Draft EIS will remain open until November 10, 1980.

The final EIS will consist of the Agency's statement of findings, permit decision, substantive comments, and responses to comments, transcript of this hearing, and any additional evaluations performed since publication of the Draft EIS.

The EPA desires to be responsive to the public and to encourage public involvement in the EIS process.

Thank you for your attendance this evening.

MR. ZELLER:

Thank you, Mr. Dal Santo.

Finally, the final presentation on the part of the government will be made by Charles Kaplan, who's on my right.

Mr. Kaplan is an engineer with the Enforcement Division, primarily responsible for development of the thermal permit and for the environmental assessment as far as the discharge is concerned.

Mr. Kaplan?

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MR. KAPLAN:

Thank you, Mr. Zeller.

Good evening, ladies and gentlemen. My name is Charles Kaplan. I'm employed by the US Environmental Protection Agency as Coordinator of the Thermal Analysis Unit in the Enforcement Division for the Region IV office. I'm headquartered in Atlanta, Georgia.

And it is my responsibilty to draft the NPDES permits for the new source plants within the Region IV area. At the registration desk there are copies of the public notice and the fact sheet for the facility.

The fact sheet contains the proposed limitations and requirements as well as the permit rationale. This information was provided to the EPA mailing list and was also provided for posting at various post offices, libraries, and town halls in this area.

The Draft NPDES permit and rationale were also included in the Draft Environmental Impact Statement.

As has been indicated to you tonight, one of the most important purposes of this hearing is to receive comments from you, the public, on this project, on the proposed wastewater discharge permit from the Crystal River Units 4 and 5, also any comments on the State certification, if you wish.

Under the provisions of the Clean Water Act, a liquid waste discharge to waters of the United States must

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meet two different sets of criteria. This first is that the effluent must meet the requirements of the effluent guidelines and standards, which were promulgated on October 8th, 1974, for the steam electric power generating point source category.

These are promulgated and contained in Title 40, Part 423 of the Code of Federal Regulations.

The second set of criteria is that the discharge, when viewed in conjunction with any other discharges, must not violate the applicable Florida Water Quality Standards.

Application of these two sets of requirements to the discharges from Crystal River 4 and 5 is in the form of effluent limitations which are included in the draft permit and which are provided in the fact sheet.

The draft permit contains limitations on the amount of pollutants, such as suspended solids, chlorine residual, heat which can be discharged into the plant discharge canal.

The fact sheet contains copies of the proposed effluent limitations and special conditions to assure that the plant is constructed and operated in an environmentally acceptable manner.

As has been stated in the public notice and reiterated tonight, the permit conditions are tentative, in draft, and are open to your comment tonight or later in writing.

There are two units proposed for addition to the three already in operation at Crystal River. These two new

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source units are under construction. As new source units, they have to meet virtually the most stringent requirements that have been promulgated by the Environmental Protection Agency.

In order to meet the limitations, Florida Power has provided facilities which will result in basically a no-discharge type of facility. The primary source of waste will be the cooling towers and their blowdown to the discharge canal.

Rainfall runoff will be generally collected in evaporation/seepage-type ponds and canals and normally will not discharge.

Other wastes that would normally result from a power plant of this nature, such as fly ash, won't have a discharge to waters of the United States.

Under the provisions of Section 316(b) of the Clean Water Act, the cooling water intake structure proposed for any new units must assure that the design, the location, the capacity, and the construction of the intake reflects the best technology available for minimizing adverse environmental impact.

EPA has tentatively determined that the proposed intake will meet these requirements.

As I close, I wish to indicate that just two weeks ago today, EPA proposed revisions to the new source performance

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standards, particularly as they relate to toxic pollutants. We are presently reviewing the impact these proposed regulations will have on the plant effluent limitations and requirements, and basically our primary review indicates that the proposed facilities will be able to meet the new requirements.

If our final complete review is such, then we will proceed to issue a five-year permit for Units 4 and 5. These evaluations and conclusions will be provided in the final Environmental Impact Statement.

Thank you again for your attention.

MR. ZELLER:

Thank you, Mr. Kaplan.

That concludes the statements for the government agencies for the record, and I will proceed with what we're really here for, to receive the public comments.

One of the goals of the Clean Water Act and NEPA is to encourage and provide for public participation and input into the decision-making process for actions legislated by these acts and to encourage government responsiveness to public concerns, and we're trying to promote a greater public awareness of actions that are proposed by the Environmental Protection Agency.

We would ask for statements from the public. We also want to make sure that everyone here is registered so we may have a record of those who are in attendance, so we can send you a notice of our determination regarding the permit.

If you haven't already registered, please do so.

Finally, when it comes down to give statements, if you have a lengthy written statement, we ask that you summarize it if possible.

Some members of this panel may ask questions of the persons that present oral comments where we think it might be necessary to clarify the nature or substance of the comments, but by and large, this would not be any cross-examination.

I'd like to ask that each person that makes a statement to please step up to the microphone. I think we want to use that podium over there.

The hearing is being recorded by a court reporter, and a transcription will be included in the public record, in the final EIS, in addition to oral or written comments submitted this evening.

The comment period on the Draft EIS will be open until November 10th. A written record of the hearing and your comments will be held as a matter of public record at the Regional Office of EPA in Atlanta.

Right at the present time the only person who has indicated that he wanted to speak is Mr. H.A. Evertz, who is Senior Counsel with Florida Power Corporation, so I'd ask Mr. Evertz, if you would come forward, please, and present a

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statement on behalf of Florida Power Corporation for the record.

MR. EVERTZ:

Thank you, Mr. Zeller.

For the record my name is H.A. Evertz, III. I reside in St. Petersburg, Florida. I'm Senior Counsel with Florida Power Corporation, and we welcome this opportunity to appear before the public at this joint hearing as the Applicant for the water discharge permit involved in this matter.

The company, of course, fully supports issuance of the permit by EPA and the certification by the State of Florida that the proposed discharge will be in compliance with all applicable standards.

We are in the process of finalizing the permit terms with EPA. We do strongly feel that we have designed an efficient coal-fired power generating station which will have minimal impact on the environment.

We seem to have shared the same speech writer, Mr. Chairman. I will pass over the portions of this written statement which have already been addressed by you and the other members of the government agencies.

I would request that the statement be submitted in the record as if read in full, however.

MR. ZELLER:

We'll be happy to do that.

MR. EVERTZ:

The Crystal River Units 4 and 5 are located in Florida Power Corporation's 4,738 acre generating complex in Citrus County, Florida. The plant site is located adjacent to the Gulf of Mexico between Crystal River to the south and the Withlacoochee River to the north.

The City of Crystal River is approximately 8 miles southeasterly of the complex. Currently Florida Power operates three existing generating units at the plant site on approximately 319 acres of cleared land.

Unit No. 1 is a 383 megawatt coal-fired unit. Unit No. 2 is a 498 megawatt coal-fired unit; and Unit No. 3, of course, is the nuclear unit, 825 megawatts power plant.

Unit 4 and 5, as mentioned, are presently under construction and will be operational for thirty years. The major components of the project include two 695 megawatt electric generating plants, two natural draft salt water cooling towers 440 feet tall, two chimneys 600 feet tall, a wastewater treatment system, a coal storage area, and an ash disposal area.

Approximately 335 acres will be cleared for this project, for the plants and the supportive facilities.

The existing barge and rail unloading facilities are adequate to handle the coal for the project, as well as existing Units 1 and 2 which burn coal.

Additional storage and handling facilities will be

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needed. Additional storage areas for coal will be adjacent to Units 4 and 5.

As mentioned, the cooling water for the units will be drawn from the intake structure for the existing units 1, 2 and 3. An average of approximately 98 million gallons of seawater per day will be required for cooling purposes for Units 4 and 5.

An average of 600,000 gallons per day of raw groundwater, fresh water if you will, will be required for plant requirements. This water will come from a well field, which will be located east of US 19 along the -- within the existing transmission line corridor east of US 19.

Of the 98 million gallons of seawater a day for cooling purposes, approximately 88 million gallons per day will be returned to the existing discharge canal downstream of the intake structure. This water is called cooling water or cooling tower blowdown.

Ash from the units will be disposed of daily on an on-site storage area, which will eventually cover 95 acres. The runoff of rainwater from the ash storage water from the coal pile and the plant site will be collected into systems of canals and ponds and will have a detention volume which exceeds the maximum ten-year twenty-four-hour rainfall event; in other words, the amount of rain that would fall over a twenty-four-hour period once every ten years.

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Under normal conditions no water would run off from the site into public water, and when it did happen, it would be an extremely rare occurrence.

As previously mentioned, the air quality in the area has been thoroughly considered and was the subject of permits already issued by the State of Florida for the construction of the two units and the Prevention of Significant Deterioration -- so-called PSD -- permit which has previously been issued by EPA.

These cover such things as the discharge of sulfur dioxide and particulates, the main things.

There will be no new transmission lines. The existing transmission corridor was originally planned to carry the current from these units out.

In order to meet its statutory duty as a public utility of providing adequate, reliable electric service to meet the future demands of its customers, the company has conducted detailed studies on projected customer growth, energy demands, and available system capacity and reserves.

From these studies it developed a generation expansion plan in order to meet its projected capacity needs. Based on historical trends and customer growth and energy use and on assumptions concerning the various factors affecting demand, Florida Power anticipates that its customers and system loads will continue to increase in the future.

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I don't think that statement surprises any of us that have lived in Florida and have seen its growth today and projected growth expectations.

Due to slowdowns in the growth of population and of the average energy use per customer resulting from conservation measures taken to date and appliance saturation, the forecasted growth rates are lower than those expected, or, experienced in the 1960's and early 1970's.

Florida Power forecasts that by the winter of 1984-85 the peak demand on its system can be expected to increase 1,200 megawatts above the 1979-1980 winter peak. This represents an annual growth rate of 4.5 percent.

Using reliability, production cost, and financial simulation computer models in its studies, Florida Power evaluated a number of alternative generation expansion plans.

For generation capacity planning purposes, a loss-of-load criterion of one day in ten years was used. This is standard industry practice and has been --- This method or criterion is approved by the Public Service Commission in the State of Florida.

Plans which were evaluated include purchases from other utilities, peaking capacity, combined cycle oil capacity and coal units of various sizes to satisfy base load capacity requirements.

Based on these evaluations, Florida Power developed

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a generation expansion plan. Fundamental to this plan is the addition of two coal-fired 695 megawatt base load generating plants, units, to begin service in December 1982 -- that'll be Unit No. 4 -- and December 1984 for Unit No. 5.

The accuracy of our load forecast has been confirmed by actual experience. The seasonal winter and summer peaks in 1980 both exceeded the forecast used in the original studies. Sharply higher oil costs and the inability to license other projects in a time-effective manner led to the cancellation of 400 megawatts of peaking and combined cycle-type units.

To help offset this lack of plant capacity, a 200 megawatt economy purchase from our neighbor to the north, the Southern Company, has been implemented.

Our current reserve projections for the 1982 through 1987 time frame are still lower than those contained in the Draft Environmental Impact Statement, which is the subject, principal subject, of this hearing.

In addition to the increased need for capacity for reliability purposes, the increased cost of oil fuels and the need to conserve these resources makes the timely completion of the two coal units essential.

Every year that one of these units is delayed will result in increased consumption of 6 million barrels of foreign oil and a fuel cost increase of 150 to 200 million dollars; and as you well know, fuel costs are passed through

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to the customer in his bill, so these are not small numbers we're looking at.

The project will have considerable socioeconomic benefits for the Citrus County/Crystal River area. The project has been and will provide employment for an average of 528 workers during the seven-year construction period. We're now approximately two years into that seven-year period.

The total payroll for the construction will be approximately 150 million dollars based on 1978 dollars. Operation and maintenance of the two units will require 162 permanent new employees at the plant with an annual payroll of $3,400,000.

Additionally, there will be an annual yield in the area of approximately $300,000 for outside contractual services required, and the addition of the units to the tax rolls will add several millions of dollars in property taxes.

As already mentioned, the site has been certified by the State of Florida in November of 1978. Florida Power feels strongly that the completion of Crystal River Units 4 and 5 at the earliest possible time is essential if the company is to continue serving its customers in a reliable and economic manner.

We urge both EPA and the Florida Department of Environmental Regulation to act promptly in issuing the final Environmental Impact Statement and the NPDES permit for the

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project.

I wish to thank EPA and the Florida Department of Environmental Regulation for this opportunity to be here and present this statement for the record.

We do have additional people, Mr. Zeller, in various areas to respond to any issue germane to the proceeding.

MR. ZELLER:

Thank you. Thank you, Mr. Evertz. Let me assure you that on behalf of EPA and the State we do intend to proceed in an expeditious manner in terms of issuing these permits, and we expect everything to be on schedule, as you've indicated.

This completes the individuals who've indicated they wanted to make a statement at the hearing tonight.

Is there anyone else at this time that would like to make a statement, or is there anyone that has any questions? We've talked a lot up here ---

Yes, ma'am?

MS. SPIVEY:

Yeah.

MR. ZELLER:

I'd like to ask you, if you would, if you don't mind, would you come up so that I can get your question on the record.

If you would, state your name.

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MS. SPIVEY:

Helen Spivey, Crystal River.

First, it's not a question. What I'm --- You keep saying November 10th, and on your little hand-out it says November 12th, your comment-close period.

MR. KAPLAN:

The 10th is the proper date.

MR. ZELLER:

The official closing date is November 10th.

MS. SPIVEY:

Okay. Now, I wrote my question on the other side. I just heard the gentleman say that Florida Power intended to keep all their ash on site, and I had read in the Environmental Impact Statement that if they could sell 26 percent of it they would.

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And then some place else in there it said that they, because of additional regulations, they would not be able to, and a couple of days ago we had an incident of someone who had been hired by Florida Power to take care of some fly ash, and they put it in a cypress swamp in which they had no permit to put it.

And if they do get to the point where they cannot contain all the fly ash on site, is Florida Power responsible for its contractors, or do we have to keep an eye on the contractors and see where they dump it or just --- Has it been

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addressed at all, or is there any kind of look-see into it?

And also, did your statement look into sink holes at all --

MR. ZELLER:

Let's try to take these ---

MS. SPIVEY:

-- if they're covering all that ground?

MR. ZELLER:

Let's try to take these one at a time.

MS. SPIVEY:

Oh, okay.

MR. ZELLER:

And let's talk a little bit about the fly ash. The new guidelines relative to new sources are quite specific in terms of fly ash handling facilities for power plants that are built under new source performance standards.

And let me ask Mr. Kaplan here to maybe talk a little bit more about that and go into a little more detail on that.

I don't think we're going to have a problem here relative to what you talked about in terms of handling the fly ash, because it's going to be a different system that's involved here compared to some of the conventional coal-fired plants where there's an ash pond, and we're looking at a little different facility, so we shouldn't have that kind of a problem

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of handling ash.

Do you agree, Mr. Kaplan?

MR. KAPLAN:

I definitely do agree. Our evaluation indicates that there will be adequate storage on site, I believe, and agreed, the company is going to try and sell as much of the fly ash as they can, 'cause it is a valuable resource.

I'm not aware of any fly ash being discharged into a cypress swamp and ---

MS. SPIVEY:

It was in the St. Pete Times a couple of days ago. It was down near Halls River, Homosassa, and I ---

MR. ZELLER:

I think this is something we very much like to -- like to investigate this. This violates several ---

MS. SPIVEY:

Well, apparently the gentleman has a permit for a fill some place to put the stuff, but he filled a place he didn't have a permit for, and I think Florida DER was called in on it. I ---

MR. BRYANT:

I'm not familiar with the case myself. I should be.

MS. SPIVEY:

But I --- I just kind of thought that, you know, if they can't contain it ---

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MR. ZELLER:

Let's --- We'll look into the -- investigate the incident you reported, but otherwise, relative to the new units that are going to be built here, there should not be any problems relative to handling the fly ash. It's going to be a totally different kind of handling system than what is normally expected at power plants, and we believe it's a very good system and applies the newest and best technology, and there should not be any problems whatsoever relative to fly ash.

MS. SPIVEY:

Okay. Can I ask another?

MR. ZELLER:

Surely, please.

MS. SPIVEY:

Did your statement address sink holes at all, or did you look into it?

I realize that there's arguments as to what causes them and what doesn't, and the last time we were afflicted with them, I think, is when they drew down Lake Rousseau.

MR. ZELLER:

I wonder if we might ask --- I'm sure that Florida Power Corporation, when they initiated construction on this site, you know, made some investigations relative to the, you know, to the topography and the soil types and any likelihood that anything like this would happen.

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Mr. Evertz, do you have someone who could speak to that, or would you like to speak to it?

MR. EVERTZ:

I think the problem brought up has to do with the fly ash from Crystal River Units 1 and 2.

As I understand it, the ash has been removed by -- under contract and is temporarily being stored, and there've been questions raised as to whether or not leachates from the fly ash in this temporary storage area will or will not adversely affect groundwater, well water, or anything like that.

I might point out that this problem should not -- if it's a problem now; I don't know that it is -- but it would not occur, I don't think, at Crystal River 4 and 5.

The ash storage area for these two units is 95 acres. The ash on the plant site adjacent to the units, the ash will be stored at present ground level. In other words, it will not be buried in an excavation.

Tests will be made on the initial storage area as to whether or not there is a leaching problem of any impurities going down into the groundwater at the plant.

The 95 acres has been sized so that the storage area is large enough to store the ash for the two units for the entire thirty-year lifetime, if necessary.

If there is a commercial use for the fly ash, it would, or course, be sold, obviously. It'd make economic

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sense to; they do use fly ash for things, making brick, as an aggregate in certain types of concrete and cement.

Should the ash leave the site, it would be by contract to the extent that Florida Power would be covered, and the transporter of the fly ash and the ultimate consumer, would be covered by whatever applicable regulations for the protection of the environment are in force at that time.

So whether or not the present situation is or is not a problem, it would not occur, I don't believe, with the fly ash from Units 4 and 5.

MR. ZELLER:

Thank you.

MR. EVERTZ:

But as to the other matter, Florida Power had been more of a bystander, more of a bystander, although the ash, of course, does come from the power plant.

It has been, I think, a problem mainly between the contractor who intends to use the fly ash and whether or not it's an appropriate temporary storage mechanism and ---

I know it has been studied quite extensively by the Department of Environmental Regulation and the local county people and ---

MR. ZELLER:

Apparently it's a matter of local permits that may be required for storage of this material, and it certainly does

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warrant investigation.

We appreciate your bringing it up.

MR. EVERTZ:

To the best of our knowledge, it is under investigation, and between the persons, the people storing the ash and whatnot.

MR. ZELLER:

Are there any other questions?

MS. SPIVEY:

You lost my sink holes.

MR. ZELLER:

Yeah.

MR. EVERTZ:

The ash at the power plant would not be in a sink hole. However, it will be stored at ---

MS. SPIVEY:

No. The ---

MR. ZELLER:

I think --- I think your question ---

MS. SPIVEY:

The amounts of water that you are intending to pump out along your easement, has anything been looked into to see if it might have some sort of an impact in causing sink holes?

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MR. ZELLER:

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Okay. I think --- Mr. O'Brien --- I think the question relative to what we're talking about in terms of sink holes is of some concern that there may be leachates from some of these storage ponds on the plant site.

MR. KAPLAN:

(Shakes head negatively) The question is will sink holes, do they exist --

MR. ZELLER:

Okay. Okay.

MR. KAPLAN:

-- or will they be generated.

MS. SPIVEY:

In other words, they're planning on pumping a tremendous -- well, he said 600,000 gallons -- and in one of these statements he said it could be up to as high as 8 million a day at 2 and a half foot drawdown in the immediate area.

MR. DAL SANTO:

This was in the EIS?

MS. SPIVEY:

Yeah. Okay. And I realize they're not going to draw that all the time, but I just wondered if anybody had looked into the possibility of this causing sink holes.

MR. ZELLER:

I think the issue has been raised in the EIS, and as a result of your bringing it up here at this meeting, why, we will make further investigation relative to any likelihood or possibility of anything like that happening.

I think it's been essentially addressed, but it will be addressed, you know, to the fullest extent --

MS. SPIVEY:

Thank you.

MR. ZELLER:

-- since you have brought it up. Thank you.

Does anybody else have any questions they'd like to ask at this time?

MR. EVERTZ:

The matter of the ground --- The 600,000 gallons of water a day in the well field was one of the subjects covered in the State site certification hearing, and it will be in compliance with rather stringent regulations of the Southwest Florida Water Management District as to how much -- the rate of drawing down water and whether or not it's causing a sinking and affecting the water on adjacent property.

It will meet all those stringent regulations.

MS. SPIVEY:

Yeah. I realize you didn't want the plant to go down the drain.

MR. EVERTZ:

It was exhaustively covered in the site certification hearing and is part of the site certification.

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MS. SPIVEY:

Okay. Thank you.

MR. ZELLER:

Does anybody else have any questions at this time? This is --- We've talked about a lot of things up here, and if you don't understand anything about the new units, this is why we're here. This is a very good opportunity for anyone to ask any questions that they may have, and we'd be pleased to, if we don't have answers, to find answers for you.

Does anybody else have anything they'd like to ask, any questions they'd like to ask at this time? If not, I intend to close the hearing.

Well, let me thank all of you for your attendance and your participation.

The record of the hearing will remain open through the close of business on November 10th, 1980. This will allow anyone wishing to submit additional statements sufficient time to do so.

Further submissions must be in writing to be included in the official record and should be sent to the attention of John Hagan at the Regional Office in Atlanta.

The final Environmental Impact Statement will be published after the close of the public comment period.

Now, the final EIS will consist of a summary of the Draft Environmental Impact Statement, the Agency's tentative

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decision on this project, responses to comments received on the Draft EIS, this transcript of the public hearing, and any other comments submitted between now and November 10th, 1980, and any other relevant information or evaluations developed after publication of the Draft EIS.

A copy of the Draft EIS should be retained if a complete evaluation of the project is desired.

Now, after consideration of all the written comments and of the requirements and policies in the Act and appropriate regulations, the EPA Regional Administrator will make determinations regarding permit issuance.

If these determinations are substantially unchanged, the EPA Regional Administrator will so notify all persons making oral statements here tonight and all persons submitting written comments.

If the determinations are substantially changed, the EPA Regional Administrator will issue a public notice indicating the revised determinations.

Within thirty days of receipt of the final determination or the date of the public notice, any interested party may request an evidentiary hearing on this determination.

Now, a request for an evidentiary hearing should be addressed to the EPA Regional Hearing Clerk. Procedures for filing evidentiary hearing requests are set out in Title 40 in the Code of Federal Regulations, Part 124.

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Unless a request for an evidentiary hearing is granted, our determination will be a final action on the part of the Environmental Protection Agency.

Pending final Agency action on an evidentiary hearing, which is granted by the Regional Administrator, the Applicant will be without a permit as a project for which a permit has been applied is a new source.

The record upon which the determination to issue is made will include both comments received at this hearing and received in response to the public notice.

The final permit will be issued no sooner than thirty days after issuance of the final Environmental Impact -- and that's in accordance with the federal regulations.

Thank you again for coming out and attending this hearing, for your participation in the process here this evening.

I now declare this hearing to be closed.

(Whereupon, at 8:25 p.m. the public hearing was concluded)

-oOo-

CERTIFICATE

This is to certify that the attached proceedings before

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY and
THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

121 NW Highway 19
Crystal River, Florida

7:30 p.m.

October 28, 1980

were held as herein appears and that this is the official transcript of the proceedings for the file of the Agency.

ANNE JAPOUR
Certified Verbatim Reporter
Official Reporter

RESPONSES TO TRANSCRIPT COMMENTS

RESPONSE T-1

See Response HLS-1 (page 4-62).

RESPONSE T-2

The factors which influence the development of sinkholes in the vicinity of the FPC Crystal River well field can be summarized as follows:

1. The limestone is cavernous.
2. The projected drawdown due to operation of the well field is about 5 feet in the vicinity of the wells. The greater drawdown is confined to the FPC power line easement.
3. No heavy structures in the vicinity of the well field are present or are planned which would load the limestone and increase the chance of sinkhole development.
4. The aquifer at the well field area acts essentially as an unconfined aquifer. There is no excessive potentiometric pressure which would provide support to the rock. Most of the overburden stress is supported by the rock itself. It is, therefore, not anticipated that any lowering of the water level will affect the present stress-strain relationship on the rock.

Sinkhole development presently occurring in the area is likely due to the cavernous nature of the limestone, long-term dissolution of the rock, and seasonal water level fluctuation. Pumping due to operation of the well field should have little or no impact on sinkhole formation in the immediate vicinity of the well field.

The average and maximum freshwater withdrawal for plant service uses will be 549,000 and 782,000 gallons per day, respectively. Statements in the Draft EIS and Technical Support Documents pertaining to 8 million gallons per day per unit freshwater usage refer to alternatives that involved freshwater cooling. As discussed in the Draft EIS and approved by the State and EPA, saltwater cooling will be used at Crystal River Units 4 and 5.

5.0 LIST OF PREPARERS

U.S. Environmental Protection Agency

John E. Hagan III	Chief, EIS Branch
Robert B. Howard	Chief, EIS Preparation Section
John P. Herrmann	Project Officer (1977-1979)
Clara J. DeLay	Project Officer (1979-3/1980)
Dario J. Dal Santo	Project Officer (3/1980-Publication)
Charles H. Kaplan	NPDES Permit
Thomas A. Gibbs	Chief, Air Facilities Branch
Edward T. Heinen	Chief, Ecological Review Branch
John T. Marlar	Chief, Water Quality Management Branch
James H. Scarbrough	Chief, Residuals Management Branch
Leonidas B. Tebo, Jr.	Chief, Ecology Branch
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Alberto Linero, M.E.	Noise Impacts
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Mel E. Lehman, M.S.	Systems Ecology
Clay A. Adams, M.S.	Aquatic Ecology
Bill Marsh, M.S.	Aquatic Ecology
James B. Holly, M.S.	Groundwater Hydrology--Geology
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Allen P. Hubbard, B.S.E.	Surface Water Hydrology, Civil Engineering
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Jack D. Doolittle, B.A.	Socioeconomics
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Marcia W. Willis (Consultant)	Archaeology
Charlotte M. Sykes, B.A.	Document Coordination
Ginger Windham, B.A.	Document Coordination
John Milko (RS&H), B.E.E., P.E.	Electrical Engineering (Need for Power)
Jackson B. Sosebee, M.S.	Water Chemistry
Greg M. Powell, M.S.	Surface Water Hydrology

6.0 COORDINATION LIST

The following Federal, State, and Local agencies and interest groups have been requested to comment on this impact statement:

Federal Agencies

Bureau of Outdoor Recreation

Coast Guard
Corps of Engineers

Council on Environmental Quality
Department of Agriculture
Department of Commerce

Department of Education
Department of Energy
Department of Health and Human Services
Department of Housing and Urban Development
Department of the Interior
Department of Transportation

Economic Development Administration
Federal Energy Commission
Federal Highway Administration
Federal Power Commission
Fish and Wildlife Service
Food and Drug Administration
Forest Service
Geological Survey
National Park Service

Nuclear Regulatory Commission
Soil Conservation Service
Federal Aviation Administration
Public Health Service

Members of Congress

Honorable Lawton Chiles
United States Senate

Honorable Don Fuqua
U.S. House of Representatives

Honorable Richard Kelly
U.S. House of Representatives

Honorable Richard Stone
United States Senate

Honorable Sam Gibbons
U.S. House of Representatives

Honorable C.W. (Bill) Young
U.S. House of Representatives

State

- Honorable D. Robert Graham, Governor
- Coastal Coordinating Council
- Department of Agriculture
- Department of Commerce
- Department of Community Affairs
- Department of Environmental Regulation
- Department of Health and Rehabilitative Services
- Department of Natural Resources
- Department of the State
- Department of Transportation
- Geological Survey
- Game and Freshwater Fish Commission

Local

- Southwest Florida Water Management District
- Withlacoochee Regional Planning Council
- Citrus County Commission
- Levy County Commission
- Hernando County Commission
- City of Crystal River
- City of Yankeetown

Interest Groups

- Florida Audubon Society
- Florida Sierra Club
- Izaac Walton League of America
- Gulf Coast Lung Association
- Florida Defenders of the Environment
- Florida Wildlife Federation
- Citrus County Civic Association

APPENDIX A

(The black bars in the margins indicate changes made in the permit since its publication in the Draft Environmental Impact Statement.)

Permit No. FL0036366

DRAFT

1/9/81

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

Florida Power Corporation
P. O. Box 14042
St. Petersburg, Florida 33733

is authorized to discharge from a facility located at

Crystal River Power Plant
Units 4 and 5
Citrus County, Florida

to receiving waters named Gulf of Mexico
from discharge points enumerated herein, as serial numbers 009, 010, 011, 012 and 013.

during the effective period of this permit

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on

This permit and the authorization to discharge shall expire at midnight, Permittee shall not discharge after the above date of expiration without prior authorization. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information, forms, and fees as are required by the Agency authorized to issue NPDES permits no later than 180 days prior to the above date of expiration.

Signed this day of

Sanford W. Harvey, Jr., Director
Enforcement Division

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on start of discharge and lasting through expiration the permittee is authorized to discharge from outfall(s) serial number(s) 009 and 010 - Cooling tower blowdown from Units 4 and 5, respectively.

Such discharge shall be limited and monitored by the permittee as specified below:

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Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Instantaneous Maximum	Two-hour Average	Measurement Frequency	Sample Type
Flow-m^3/Day (MGD)	N/A	N/A	Continuous	Recorder (totalizer)
Temperature $^oC(^oF)$	N/A	35.6(96.0)	Continuous	Recorder
Total Residual Oxidants (TRO) mg/1	0.01 4/	N/A	Continuous 1/	Recorder
Phosphorus (mg/1 as P)	N/A	10.0	1/week 2/	Grab
Calcium (mg/1)	N/A	N/A	1/week	Grab
Conductivity 3/	N/A	N/A	Continuous	Recorder
Cycles of Concentration	N/A	N/A	1/week	Calculation

Operation of the dechlorination system shall be maintained to assure than excessive quantity of sulfur dioxide are not discharged.

Discharge temperature shall not exceed the lowest temperature of the recirculating cooling water prior to the addition of make-up.

There shall be no discharge of detectable amounts of materials added for corrosion inhibition (including but not limited to zinc, chromium and phosphorus) or any chemicals added which contain the 129 priority pollutants.

A-2

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored 1/day.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): discharge from each cooling tower prior to mixing with other waste streams except that temperature and TRO shall be monitored in the blowdown canal prior to discharge to the site discharge canal.

1/ Manual monitoring for TRO and check-out of the continuous monitor shall be conducted not less than one/week during periods of maximum expected TRO concentrations. The continuous monitor shall have a limit of detection of not more than 0.05 mg/1. Prior to start of discharge, evaluation of the proposed monitor shall be completed by the permittee and results submitted to EPA.

2/ Limitation and monitoring requirement are not applicable if permittee does not add compounds containing phosphorus to the condenser cooling water system.

3/ Reporting shall be in mg/1 of Total Dissolved Solids.

4/ Non detection by approved analysis technique shall be deemed compliance with this limitation.

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on start of discharge and lasting through expiration the permittee is authorized to discharge from outfall(s) serial number(s) 011 - Coal Storage Area Runoff from Units 4 and 5

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations	Monitoring Requirements 1/	
	Instantaneous Maximum	Measurement Frequency	Sample Type
Flow-m^3/Day (MGD)	N/A	1/week	Weir Reading 3/
Total Suspended Solids (mg/1)	50 1/2/	1/week	Grab
Metals Monitoring	See Below	1/month	Grab

Monitoring for metals shall include total arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, and zinc. In the event that no discharge occurs during the three-month reporting period, a sample for metals analysis shall be taken in the pond near the effluent point.

Note: Monitoring requirements are applicable only during periods of discharge except as noted for metal monitoring.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): point(s) of discharge from treatment system prior to mixing with other waste streams.

1/ Applicable to any flow up to the flow resulting from a 24-hour rainfall event with a probable recurrance interval of once in ten years. If an impoundment is utilized by permittee, it shall be capable of containing a 10-year, 24-hour rainfall event.

2/ In the event that the effluent concentration exceeds this limitation, the permittee may attempt to demonstrate that treatment in the runoff retention system assured compliance prior to discharge to the discharge canal.

3/ An event recorder shall also be provided and the number of discharges per month shall be reported quarterly.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on start of discharge and lasting through expiration the permittee is authorized to discharge from outfall(s) serial number(s) 012 from Units 4 and 5 - Ash Pile Runoff

Such discharges shall be limited and monitored by the permittee as specified below:

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Effluent Characteristics	Discharge Limitations	Monitoring Requirements	
	Instantaneous Maximum	Measurement Frequency	Sample Type
Flow-m^3/Day (MGD)	N/A	1/week	Weir Reading 2/
Total Suspended Solids (mg/1)	1/	1/week	Grab
Metals Monitoring	See Below	1/month	Grab

Monitoring for metals shall include total arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, and zinc. In the event that no discharge occurs during the three-month reporting period, a sample for metals analysis shall be taken in the pond near the effluent point.

Note: Monitoring requirements are applicable only during periods of discharge except as noted for metal monitoring.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Point(s) of discharge from treatment system piror to mixing with other waste streams.

1/ Pending repromulgation of effluent guidelines for this waste category, limitations on total suspended solids shall not be applicable. Within 90 days of repromulgation, permittee shall submit a proposed implementation schedule and shall expeditiously complete necessary facilities, if any, to assure compliance with such repromulgated regulations.

2/ An event recorder shall also be provided and the number of discharges per month shall be reported quarterly.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on start of discharge and lasting through expiration the permittee is authorized to discharge from outfall(s) serial number(s) 013 - Runoff Collection System Overflow from Units 4 and 5

Such discharges shall be limited and monitored by the permittee as specified below:

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Effluent Characteristic	Discharge Limitations	Monitoring Requirements	
	Instantaneous Maximum	Measurement Frequency	Sample Type
Flow-m³/Dav (MGD)	N/A	1/day	weir reading 2/
Total Suspended Solids (mg/1)	50 1/	2/week	Grab.
Metals Monitoring	See Below	1/month	Grab
Oil and Grease (mg/1)	N/A	1/week	Grab

Monitoring for metals shall include total arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, and zinc. Discharge concentrations for heavy metals and other pollutants shall be in conformance with Florida Administrative Code Chapters 17-3 and 17-4 at the discharge point or boundary of mixing zone (See Part III.E.).

Note: Monitoring requirements are applicable only during periods of discharge except for metal monitoring.

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored 1/day 1/.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): point(s) of discharge from treatment system prior to mixing with other waste streams, except that heavy metal monitoring shall be after combination with cooling tower blowdown but before discharge to the plant effluent canal.

1/ Applicable to any flow up to the flow resulting from a 24-hour rainfall event with a probable recurrance interval of once in ten years. If an impoundment is utilized by permittee, it shall be capable of containing a 10-year, 24-hour rainfall event.

2/ An event recorder shall also be provided and the number of discharges per month shall be reported quarterly.

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A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on start of intake and lasting through expiration the permittee shall monitor serial number(s) 014 - Intake Units 4 and 5

Such intake(s) shall be monitored by the permittee as specified below:

Influent Characteristic	Discharge Limitations		Monitoring Requirements	
	Daily Average	Instantaneous Maximum	Measurement Frequency	Sample Type
Flow-m^3/Day (MGD)	N/A	N/A	Continuous	Pump logs
Total Dissolved Solids (mg/l)	N/A	N/A	1/week	Grab
Calcium (mg/l)	N/A	N/A	1/week	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Plant intake.

Intake screen backwash may be discharged after passage through a trash removal basket without limitation or monitoring requirements.

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B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

a. Achieve compliance with effluent limitations (009 through 013)- On start of discharge(s)

b. Evaluation of TRO continuous monitor (009 and 010) - Prior to start of discharge

c. Plume evaluation (Part III.E.), if required

(1) First report - 15 months after commercial operation date of Unit 4
(2) Second report - 15 months after commercial operation date of Unit 5

d. Leachate testing and monitoring program (Part III.H.)
(1) Reports - monthly commencing on the effective date of this permit*

e. Ground water monitoring program (Part III.K.)
(1) Implement - 12 months prior to receipt of coal for Units 4 and 5
(2) First report - 4 months after commercial operation date of Unit 4
(3) Subsequent reports - Quarterly after the first report

f. Manatee Procedures Notification (III.L.) - One month after effective date of this permit.

g. Salt drift monitoring program (Part III.M.)
(1) Implement - December 1, 1981
(2) Drift Study Reports - Quarterly with Discharge Monitoring Reports (Part I.C.2)

h. Drift rate testing and assessments (Part III.M.)
(1) Reports of maximum drift rate - 12 months after commercial operation date of each unit
(2) Certification of operation - Quarterly with Discharge Monitoring Reports (Part I.C.2)

i. Toxic Scan (Part III.O.)
(1) Submit data - nine months after commercial operation date of Unit 4

2. **No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.**

Note: Any construction of new waste treatment facilities or alterations to existing waste treatment facilities will require a permit or authorization for construction in accordance with applicable state law and regulation.

*Reports shall be submitted to Chief, EIS Branch.

C. MONITORING AND REPORTING

1. *Representative Sampling*

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. *Reporting*

Monitoring results obtained during the previous 3 months shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first report is due on . Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator and the State at the following addresses:

Chief, Water Enforcement Branch
Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30308

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

3. *Definitions*

a. The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

b. The "daily maximum" discharge means the total discharge by weight during any calendar day.

c. "Weighted by flow" means the summation of each sample concentration times its respective flow in convenient units divided by the summation of the flow values.

d. "Nekton" means free swimming aquatic animals whether of freshwater or marine origin.

e. For the purpose of this permit, a calendar day is defined as any 24-hour period, except that for temperature and flow it shall be from midnight to midnight.

f. For the purpose of this permit, continuous measurement frequency is defined as measurements taken at intervals of no greater than one hour each.

g. "Multiple grabs" shall mean samples taken of intervals of no greater than 15 minutes over the entire period of total residual chlorine discharge.

h. "Two-hour average" shall mean an average of all values obtained in a continuous 120-minute period.

4. *Test Procedures*

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

5. *Recording of Results*

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

6. *Additional Monitoring by Permittee*

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (EPA No. 3320-1). Such increased frequency shall also be indicated.

7. *Records Retention*

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State water pollution control agency.

A. MANAGEMENT REQUIREMENTS

1. *Change in Discharge*

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. *Noncompliance Notification*

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the following information, in writing, within five (5) days of becoming aware of such condition:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

3. *Facilities Operation*

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

4. *Adverse Impact*

The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. *Bypassing*

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

6. *Removed Substances*

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. *Power Failures*

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or, if such alternative power source is not in existence, and no date for its implementation appears in Part I,

b. Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

B. RESPONSIBILITIES

1. *Right of Entry*

The permittee shall allow the head of the State water pollution control agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

2. *Transfer of Ownership or Control*

In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

3. *Availability of Reports*

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

4. *Permit Modification*

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. *Toxic Pollutants*

Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

6. *Civil and Criminal Liability*

Except as provided in permit conditions on "Bypassing" (Part II, A-5) and "Power Failures" (Part II, A-7), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. *Oil and Hazardous Substance Liability*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. *State Laws*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected hereby.

PART III

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OTHER REQUIREMENTS

A. In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

B. If the permittee, after monitoring for at least 12 months, determines that he is consistently meeting the effluent limits contained herein, the permittee may request of the Regional Administrator that the monitoring requirements be reduced to a lesser frequency or be eliminated.

C. There shall be no discharge of polychlorinated byphenyl compounds such as those commonly used for transformer fluid.

D. The company shall notify the Regional Administrator in writing not later than sixty (60) days prior to instituting use of any additional biocide or chemical used in cooling systems, other than chlorine, which may be toxic to aquatic life other than those previously reported to the Environmental Protection Agency. Such notification shall include:

1. name and general composition of biocide or chemical,
2. frequencies of use,
3. quantities to be used.,
4. proposed discharge concentrations, and
5. EPA registration number, if applicable.

E. Effluent discharge from Units 4 and 5 shall be designed and operated to assure compliance with Florida Water Quality Standards limitations (pH-6.0 to 8.5, cadmium 0.005 mg/l, copper 0.015 mg/l, etc.) at a distance of 150 meters (492 feet) from the point of discharge into the discharge canal under all expected operating modes of Units 1-5. Subsequent to commercial operation of each unit, field measurements (supplemented as necessary with modeling results) shall be conducted, if found to be required after plant operation begins, to determine the three dimensional configuration of the discharge plume, determine minimum dilution factor expected, and substantiate conformance with the 150-meter (492 foot) mixing zone. Reports on this study shall be submitted not later than 15 months after the commercial operation dates of Units 4 and 5, respectively.

F. Permittee shall maintain daily records of rainfall at the plant site.

G. There shall be no point source discharge of the following categories of wastes to Waters of the United States or to any waste stream which enters such Waters: construction runoff, low volume wastes (including, but not limited to wet scrubber air pollution control systems, ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, floor drainage, cooling tower basin cleaning wastes and blowdown from recirculating house service water system), metal cleaning wastes (cleaning compounds, rinse waters, or any other waterborne residues derived from cleaning any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning and air preheater cleaning and specifically including such water wash operations as hosing down boiler fireside surfaces), sanitary wastes and boiler blowdown. Event recorders shall be placed at all overflow points from evaporation/seepage ponds receiving such wastes to assure compliance with this requirement (not applicable to the plant drains collection pond).

H. The Permittee shall implement the leachate testing and monitoring program for the ash disposal area as generally specified in Special Condition XII.A. of the State Power Plant Site Certification Order issued by the Governor and Cabinet on November 21, 1978, (hereinafter "Order") and as submitted to EPA on October 4, 1979. Status reports on the program shall be submitted monthly commencing on the effective date of the NPDES permit. Based on results of the program, the Permittee shall select an environmentally sound ash disposal strategy acceptable to EPA and the State, provided that the disposal strategy shall meet any applicable EPA or State regulations whichever are more stringent. The Permittee shall consult with and obtain EPA and State approval prior to initiating changes in the ash disposal strategy.

I. The Permittee shall consult with EPA and the State at such time as the need for additional ash disposal site(s) or new coal storage area(s) is identified. Consultation shall be initiated at a sufficiently early time so as to provide adequate opportunity for a thorough evaluation of the environmental impacts of the proposed action. No site other than those described in the EIS shall be used for Units 4 and 5 without prior approval of the Director, Enforcement Division.

J. The Permittee shall line the area of any coal pile directly associated with Units 4 and 5 if the pyritic sulfur content of the coal is greater than 0.2% in conformance with Special Condition XII.B. of the Order.

K. The Permittee shall implement a groundwater monitoring program approved by EPA and the State. The program shall be implemented not later than one year prior to receipt of coal for Units 4 and 5. Reporting shall be quarterly in conformance with requirements of the Order and shall commence four months after operation of the first unit. Reports may be submitted to EPA with DMRs (see I.C.2).

Should the reports demonstrate significant contamination of groundwater is occurring, the Permittee shall immediately consult with EPA and the State and expeditiously institute reasonable corrective measures acceptable to EPA and the State to mitigate the problem and to ensure that no further significant leaching occurs. These measures may include but not be limited to: sealing, relocating, or altering operations of the ash disposal area, plant drains collection pond, or coal piles. If the reports demonstrate no significant contamination is occurring, the Permittee after consultation with and approval by the Director, Enforcement Division, may reduce or eliminate the monitoring program.

In the event that changes in the monitoring program become necessary, such changes shall be approved by the Director, Enforcement Division, and the State Director prior to institution.

L. The Permittee shall ensure that contractors, whose activities may impact manatees, instruct all personnel associated with such activities about the potential presence of manatees in the area and that all vessles associated with the project shall operate at "no wake" speeds at all times while in shallow waters of channels where the draft of the boat provides less than three feet clearance of the bottom. The Permittee shall ensure that all personnel are advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Endangered Species Act and that the contractor is notified it shall be held responsible for any manatee harmed, harassed or killed as a result of any of its activities.

The Permittee shall provide written documentation that all affected parties have been informed of this condition by not later than 1 month after the effective date of this permit.

M. The Permittee shall commence one year prior to operation of the first cooling tower, but not later than December, 1981, the salt drift monitoring program approved by EPA and the State. Program progress reports and monitoring reports shall be submitted quarterly with the DMR's (see I.C.2) commencing with implementation of the salt drift monitoring program. The program shall be conducted for at least two years following operation of the second tower.

If the reports indicate significant impacts are occurring to the nearby area, the Permittee shall consult with EPA and the State and shall initiate reasonable corrective measures acceptable to EPA and the State to mitigate these impacts. Should the reports indicate no significant impacts are occurring to the nearby area, the Permittee after consultation with and approval by the Director, Enforcement Division, may reduce or eliminate the monitoring program.

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Cooling towers shall be designed and operated to assure a maximum drift rate of 0.0005% of the circulating water rate. The applicant shall submit written evidence that this performance is guaranteed by the cooling tower manufacturer. Tests showing compliance shall be submitted within twelve months of the commercial operation of each unit. The drift eliminators will be inspected not less than every three months. Certification that the drift eliminators are properly installed and in good working order will be made at the time of submission of reports required by part I.C.2.

Subsequent NPDES permits may require tests of the cooling towers be conducted to verify a maximum drift rate of 0.0005% of the circulating water rate.

N. In accordance with Section 306(d) of the Clean Water Act (33 USC Section 1251, et seq.) effluent limitations based on standards of performance contained in this permit shall not be made any more stringent during a ten year period beginning on the date of completion of such construction or during the period of depreciation or amortization of such facility for the purposes of Section 167 or 169 (or both) of the Internal Revenue Code of 1954, whichever period ends first. The provisions of Section 306(d) do not limit the authority of the Environmental Protection Agency to modify the permit to require compliance with a toxic effluent limitation promulgated under BAT or toxic pollutant standard established under Section 307(a) of the Clean Water Act, or to modify, as necessary, to assure compliance with any applicable State Water Quality Standard. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under sections 301(b)(2)(C), and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

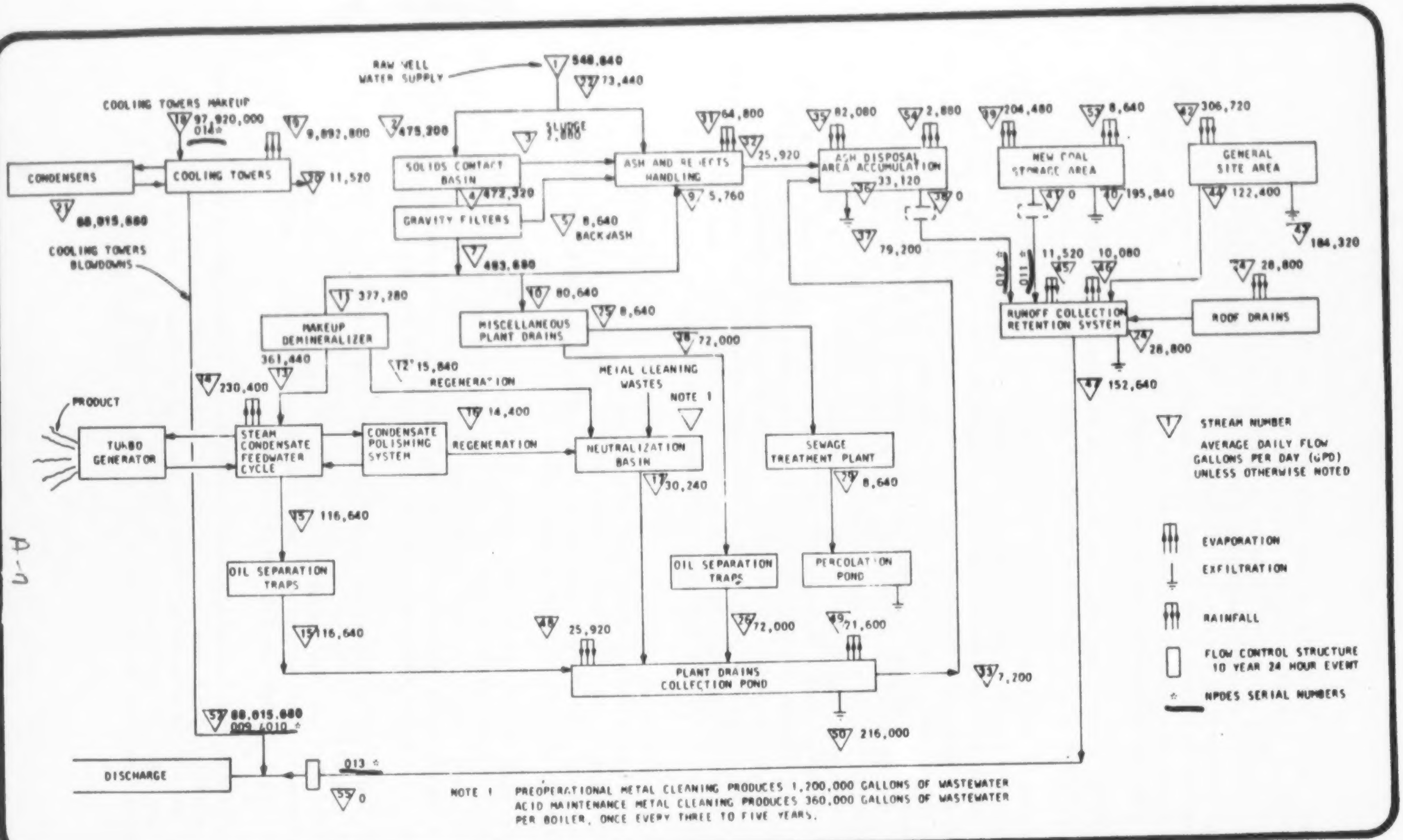
(1) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
(2) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

O. Not more than nine months after the Commercial Operation Date of Unit 4, permittee shall submit representative data as included in 40 CFR Part 122.53(d)(7)(ii), (iii) and (iv). In the event that any pollutant is present at an unacceptable level, this permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable provisions of the Clean Water Act.

P. The State of Florida Department of Environmental Regulation has certified the discharge(s) covered by this permit with conditions (Attachment B). Section 401 of the Act requires that conditions of certification shall become a condition of the permit. The monitoring and sampling shall be as indicated for those parameters included in the certification.

Any effluent limits and any additional requirements specified in the attached state certification which are more stringent, supersede any less stringent effluent limits provided herein. During any time period in which the more stringent state certification effluent limits are stayed or inoperable, the effluent limits provided herein shall be in effect and fully enforceable.


RAW WELL WATER SUPPLY
1 548,840
22 73,440
COOLING TOWERS MAKEUP
18 97,920,000
014 ☆
19 9,892,800
2 475,200
3 SLUDGE 2,880
CONDENSERS
COOLING TOWERS
20 11,520
21 88,015,880
SOLIDS CONTACT BASIN
4 472,320
GRAVITY FILTERS
5 8,640 BACKWASH
7 483,680
ASH AND REJECTS HANDLING
9 5,760
31 64,800
32 25,920
35 82,080
54 2,880
ASH DISPOSAL AREA ACCUMULATION
36 33,120
38 0
37 79,200
39 204,480
53 8,640
NEW COAL STORAGE AREA
41 0
40 195,840
42 306,720
GENERAL SITE AREA
44 122,400
43 184,320
012 ☆
011 ☆
11,520
45
10,080
46
24 28,800
RUNOFF COLLECTION RETENTION SYSTEM
ROOF DRAINS
26 28,800
47 152,640
COOLING TOWERS BLOWDOWNS
11 377,280
MAKEUP DEMINERALIZER
361,440
13
12 15,840
REGENERATION
10 80,640
MISCELLANEOUS PLANT DRAINS
25 8,640
28 72,000
METAL CLEANING WASTES
NOTE 1
14 230,400
PRODUCT
TURBO GENERATOR
STEAM CONDENSATE FEEDWATER CYCLE
CONDENSATE POLISHING SYSTEM
16 14,400
REGENERATION
NEUTRALIZATION BASIN
17 30,240
SEWAGE TREATMENT PLANT
29 8,640
15 116,640
OIL SEPARATION TRAPS
OIL SEPARATION TRAPS
PERCOLATION POND
15 116,640
48 25,920
26 72,000
49 71,600
PLANT DRAINS COLLECTION POND
33 7,200
50 216,000
52 88,015,680
009 010 ☆
DISCHARGE
013 ☆
55 0
STREAM NUMBER
AVERAGE DAILY FLOW GALLONS PER DAY (GPD) UNLESS OTHERWISE NOTED
EVAPORATION
EXFILTRATION
RAINFALL
FLOW CONTROL STRUCTURE 10 YEAR 24 HOUR EVENT
☆ NPDES SERIAL NUMBERS

NOTE 1 PREOPERATIONAL METAL CLEANING PRODUCES 1,200,000 GALLONS OF WASTEWATER ACID MAINTENANCE METAL CLEANING PRODUCES 360,000 GALLONS OF WASTEWATER PER BOILER, ONCE EVERY THREE TO FIVE YEARS.

A-1

Figure 3.3-1

PLANT WATER USE DIAGRAM

SOURCE: Black and Veatch, 1980

FLORIDA POWER CORPORATION

PROPOSED
CRYSTAL RIVER UNITS 4 & 5

CITRUS COUNTY, FLORIDA

ATTACHMENT A
Permit No. FL0036366

ATTACHMENT B
Permit No. FL0036366

STATE CERTIFICATION

Units 4 and 5

(To be included with permit prior to issuance)

January 9, 1981

Crystal River Power Plant
Units 4 and 5
Permit Rationale
NPDES No. FL0036366

I. Applicable Regulations

A. Federal performance standards for new sources: Chemical wastes (40 CFR 423.15) and area runoff (40 CFR 423.45).

B. Florida Water Quality Standards: Receiving waters are classified as Class III waters - Recreation - Propagation and Management of Fish - Surface Waters (Florida Administrative Code. Chapters 17-3, 17-4 and 17-6)

C. Florida Site Certification (FSC). Florida Administrative Code, Chapter 403.

II. Effluent Limitations

A. Outfall serial numbers 009 and 010.

1. Temperature: Two-hour maximum average blowdown temperature of 34.2 C (96.0 F) as requested by the applicant has been incorporated, consistent with the Florida Site Certification (FSC).

2. Phosphorus - 10 mg/l limitation as requested by the applicant. The applicant feels that a phosphate compound may be necessary as a scale inhibition (not corrosion inhibitor). Addition will not initially be implemented and will be started only if necessary for proper cooling tower operation. Monitoring is therefore only required if addition is implemented.

3. Chlorine - Limitations proposed are are consistent with 40 CFR 423.15(i) and (j) and FSC requirements.

4. Corrosion inhibiting substances and priority pollutants. Prohibited in accordance with 40 CFR 423.15(i) and proposed 40 CFR 423.15(k).

5. pH: Range of 6.0 to 9.0 in accordance with 40 CFR 423.15(a).

B. Outfall serial number 011.
   1. Total suspended solids. 50 mg/l limitation consistent with 40 CFR 423.45(a) and (b).
   2. pH: Included in serial 013.
   3. Metals monitoring. Required to quantify waste characteristics and assure compliance with Florida Water Quality Standards requirements.

C. Outfall serial number 012.
   1. No limitations due to remand of regulations. Otherwise included in serial 013.
   2. Monitoring. Required to quantify waste characteristics and assure compliance with Florida Water Quality Standards requirements.

D. Outfall Serial number 013 - Runoff Collection System Overflow (includes 011 and 012)
   1. Total Suspended Solids - 50 mg/l limitation consistent with 40 CFR 423.45 (a) and (b), although remanded and FSC requirements.
   2. pH. Range of 6.0 to 9.0 in accordance with 40 CFR 423.15(a).
   3. Other monitoring. Required to quantify waste characteristics and assure compliance with Florida Water Quality Standards requirements.

E. On October 14, 1980, EPA published proposed regulations (40 CFR Part 423) in the Federal Register (45 FR 68328) which included proposed New Source Performance Standards as well as proposed requirements for Best Practicable Control Technology Currently Available, Best Available Technology Economically Achievable, Best Conventional Pollutant Control Technology, and Pretreatment. Working from these proposed regulations, a tentative best professional judgement has been made that the effluents from the plant will comply with the New Source Performance Standards for New Sources as related to the 65 "priority" pollutants and classes of pollutants "toxic" under Section 307(a) of the Act. It is therefore proposed that the permit be issued for a five-year period. This best professional judgement is based on the following:

   1. No PCB containing equipment will be placed on site. (Complies with propose Section 423.15(b), which is unchanged from existing Section 423.15(b).)

2. Bottom ash will be removed and handled by a closed recycling system which will not have a discharge to surface waters. (Exceeds requirements of proposed Section 423.15(e).)

3. Dry fly ash handling is proposed. (Complies with proposed Section 423.15(f).)

4. Metal cleaning wastes will be pretreated and disposed of in an evaporation/seepage pond with no discharge to surface waters. (Exceeds requirements of proposed section 423.15(d) which are unchanged from existing Section 423.15(f).)

5. Total residual oxidants (Serial Number 009 and 010) is limited to 0.01 mg/l in the discharge from units 4 and 5 to the plant discharge canal to comply with Florida Water Quality Standards requirements. This will assure compliance with proposed Section 423.15(j). Dechlorination facilities will be used by the applicant to achieve compliance. A prohibition against the discharge of detectable amounts of any chemical added which contains any priority pollutant is included. (Complies with proposed Section 423.15(k).

6. A reopener clause is included in the draft permit (Part III.N.) to assure that if more stringent regulations than those proposed are ultimately promulgated, the permit can be reopened to included such more stringent requirements.

7. A special condition (Part III.O) has been included which requires the permittee to conduct and submit priority pollutant scans not more than nine months after the commercial operation date of Unit 4. This will assure that unanticipated pollutants are not present at unacceptable levels and/or that the permit could be reopened to provide additional limitations and requirements if unacceptable levels are found.